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ABSTRACT

This is one of a series of studies on the training, recruitment, and utilization of teachers in member countries of the Organization for Economic Cooperation and Development. This volume deals with Switzerland and Yugoslavia. The section on Switzerland (37 pages) is in French with no translation. The chapters deal with training of teachers and recruitment problems. The section on Yugoslavia (235 pages) has chapters on the present-day teacher situation and teacher needs in the coming period, ways and means of teacher training, teacher employment and remuneration policy, conditions of work for teachers, and other factors that influence the quality of teachers' work. Related documents are SP 005 358 through SP 005 363. (MBM)

SP

FORMATION, RECRUTEMENT
ET UTILISATION DES ENSEIGNANTS

TRAINING, RECRUITMENT
AND UTILISATION OF TEACHERS

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*ENSEIGNEMENTS
PRIMAIRE
ET SECONDAIRE*

*PRIMARY
AND SECONDARY
EDUCATION*

SUISSE
YUGOSLAVIA

SP005364

DIRECTION DES AFFAIRES SCIENTIFIQUES
DIRECTORATE FOR SCIENTIFIC AFFAIRS

ORGANISATION DE COOPÉRATION ET DE DÉVELOPPEMENT ÉCONOMIQUES
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT
1968/2

L'Organisation de Coopération et de Développement Économiques a été instituée par une Convention signée le 14 décembre 1960, à Paris, par les membres de l'Organisation Européenne de Coopération Économique, ainsi que par le Canada et les États-Unis. Aux termes de cette Convention, l'O.C.D.E. a pour objectif de promouvoir des politiques visant :

- *à réaliser la plus forte expansion possible de l'économie et de l'emploi et une progression du niveau de vie dans les pays Membres, tout en maintenant la stabilité financière, et contribuer ainsi au développement de l'économie mondiale ;*
- *à contribuer à une saine expansion économique dans les pays Membres, ainsi que non membres, en voie de développement économique ;*
- *à contribuer à l'expansion du commerce mondial sur une base multilatérale et non discriminatoire, conformément aux obligations internationales.*

La personnalité juridique que possédait l'Organisation Européenne de Coopération Économique se continue dans l'O.C.D.E., dont la création a pris effet le 30 septembre 1961.

Les membres de l'O.C.D.E. sont : la République fédérale d'Allemagne, l'Autriche, la Belgique, le Canada, le Danemark, l'Espagne, les États-Unis, la France, la Grèce, l'Irlande, l'Islande, l'Italie, le Japon, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, le Royaume-Uni, la Suède, la Suisse et la Turquie.

The Organisation for Economic Co-operation and Development was set up under a Convention signed in Paris on 14th December 1960 by the Member countries of the Organisation for European Economic Co-operation and by Canada and the United States. This Convention provides that the O.E.C.D. shall promote policies designed:

- *to achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries, while maintaining financial stability, and thus to contribute to the world economy;*
- *to contribute to sound economic expansion in Member as well as non-member countries in the process of economic development;*
- *to contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations.*

The legal personality possessed by the Organisation for European Economic Co-operation continues in the O.E.C.D. which came into being on 30th September 1961.

The members of O.E.C.D. are Austria, Belgium, Canada, Denmark, France, the Federal Republic of Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

Afin de faire le point sur la situation du corps enseignant au niveau de l'enseignement primaire et secondaire tant sur le plan quantitatif que sur le plan qualitatif, dans les années récentes et dans le futur, le Comité du Personnel Scientifique et Technique de l'OCDE a décidé d'entreprendre une étude de synthèse reposant sur des données de base recueillies dans un certain nombre de pays Membres de l'OCDE et consignées dans des monographies nationales. Cette série de monographies nationales est publiée en plusieurs volumes par les soins de l'Organisation.

In order to take stock of the current and future teacher situation in primary and secondary education, both in quantitative and qualitative terms, the Committee for Scientific and Technical Personnel of OECD decided to prepare a general report on this subject which would synthesise the data gathered in a certain number of OECD Member countries and which are presented in a series of country case-studies. This series of case-studies is published by the Organisation in several volumes.

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PREFACE

Le Comité du Personnel Scientifique et Technique de l'O.C.D.E. a témoigné un vif intérêt aux problèmes soulevés par l'offre et la demande de personnel enseignant. Ce dernier est vite apparu comme un élément fondamental du développement quantitatif et qualitatif du système d'enseignement. La recherche d'un équilibre entre l'offre et la demande de personnel enseignant nécessite la mise en oeuvre de politiques spécifiques de formation, de recrutement et d'utilisation intéressant l'un des secteurs les plus importants de la main-d'oeuvre hautement qualifiée.

A l'occasion d'études globales des "ressources en personnel scientifique et technique dans les pays de l'O.C.D.E." et de la "politique générale et de la planification en matière d'enseignement" dans de nombreux pays membres et dans un rapport plus spécialement consacré aux "effectifs, au recrutement et à la formation des professeurs de sciences et de mathématiques", décidées par le Comité du Personnel Scientifique et Technique, certains aspects des problèmes soulevés par la demande et l'offre de personnel enseignant avaient été mis en lumière.

Afin de faire le point sur la situation du corps enseignant au niveau de l'enseignement primaire et secondaire tant du point de vue quantitatif que qualitatif, dans les années récentes et dans le futur, le Comité a décidé d'entreprendre une étude de synthèse reposant sur des données de base recueillies dans un certain nombre de pays membres de l'O.C.D.E. et consignées dans des monographies nationales.

La monographie ci- après, intéressant la Suisse, fait partie de la série de monographies nationales consacrées à la formation, au recrutement et à l'utilisation des enseignants de l'enseignement primaire et secondaire.

Elle a été préparée par le Secrétariat à l'aide des données transmises par les autorités suisses, en particulier par le Centre d'Information en matière d'Enseignement et d'Education de Genève, à titre de contribution à l'élaboration de cette série de monographies nationales.

ETUDE SUR L'OFFRE ET LA DEMANDE DE PERSONNEL ENSEIGNANT

SUISSE

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CHAPITRE I : FORMATION DES ENSEIGNANTS

1. Formation des instituteurs

A l'heure actuelle, on peut distinguer trois types de formation des instituteurs.

(a) Formation à l'école normale

Les élèves à l'âge de 15 ou 16 ans, à l'issue de la scolarité obligatoire et, en particulier, du premier cycle de l'enseignement secondaire, entrent dans des écoles normales où la scolarité s'étend sur 4 ou 5 années. Les écoles normales de cinq ans tendent à créer un cycle inférieur de trois ans orienté vers l'acquisition d'une culture générale et un cycle supérieur de deux années davantage consacré à la formation professionnelle et aux matières facultatives. Ce système de formation en quatre ou cinq années dans un établissement autonome est le plus répandu, principalement dans les cantons ruraux.

(b) Formation dans un cycle supérieur d'une école normale après des études conduisant à un "baccalauréat pédagogique"

A l'issue du premier cycle de l'enseignement secondaire, les futurs instituteurs fréquentent soit une section pédagogique d'un établissement secondaire supérieur, soit un cycle inférieur d'une école normale. Les études qui durent de 3 ans 1/2 à 4 années, permettent d'obtenir un baccalauréat pédagogique offrant la possibilité de s'inscrire soit dans le cycle supérieur de l'enseignement normal, soit à l'université. Le cycle supérieur de l'école normale dure de 1 an à 1 an 1/2 et, est consacré à la formation professionnelle. Bien que la section pédagogique, de niveau secondaire, soit spécialisée, on estime que le contact du futur instituteur avec les élèves des autres sections de l'établissement secondaire sera bénéfique. Il faut signaler qu'à Zurich, il est possible pour un titulaire du baccalauréat fédéral d'entrer dans le cycle supérieur de l'école normale à condition de fréquenter un cours préliminaire de 6 mois destiné à compenser le fait qu'il n'a pas fréquenté une "section pédagogique" de niveau secondaire.

(c) Formation de niveau universitaire

Deux villes-cantons seulement (Genève et Bâle-ville) organisent une formation de niveau universitaire : deux années à Bâle-ville, trois années à Genève. Les futurs enseignants sont recrutés avec le baccalauréat et reçoivent une formation pédagogique théorique et pratique. A Genève, un examen d'entrée au début de ces études normales supérieures devait permettre de sélectionner les élèves qui se révèlaient doués pour l'enseignement. Malheureusement, la pénurie de maîtres n'a pas permis de maintenir cette obligation.

2. Professeurs de l'enseignement secondaire inférieur (enseignement général)

Les instituteurs de l'école primaire supérieure reçoivent une formation spéciale ou complémentaire dans des écoles normales d'instituteurs, ou lors de session de perfectionnement. Leur formation est centrée sur les méthodes pédagogiques à employer vis-à-vis des adolescents non orientés vers les études abstraites. A Bâle-ville, cette formation s'obtient après une année d'études spécialisées après la formation initiale d'instituteur de 2 ans. En ce qui concerne les écoles secondaires inférieures de nombreuses universités et une école normale spécifique à St. Gall préparent les enseignants de ces écoles. Les deux types d'enseignants de l'enseignement secondaire ne se rencontrent réellement qu'en Suisse alémanique. En Suisse Romande, tous les enseignants des écoles dites "moyennes" ont la même formation (universitaire), qu'ils soient affectés au premier ou au deuxième cycle. En Suisse Alémanique il existe donc deux types d'enseignants, formés différemment ; néanmoins il y a des exceptions : des enseignants ayant les qualifications pour enseigner au niveau du second cycle, enseignent au niveau du premier cycle dans les sections classiques, dans les petites écoles secondaires, les enseignants sont souvent appelés à enseigner dans les deux cycles. La formation des enseignants du premier cycle se rapproche de celle donnée à l'école normale. Comme on peut y entrer avec un diplôme d'instituteurs puis éventuellement poursuivre des études afin d'obtenir les qualifications permettant d'enseigner au niveau du 2ème cycle, cette structure tend à développer une certaine promotion au sein du corps enseignant. Les candidats doivent être titulaires de la "maturité" ou d'un diplôme d'instituteur. Ces cours de formation durent en général entre deux et trois ans. Les élèves-professeurs choisissent entre deux sections : histoire - langues et mathématiques - sciences. La formation pédagogique fait partie du plan d'études.

3. Professeurs de l'enseignement secondaire supérieur

Le titre de professeur de l'enseignement secondaire supérieur est délivré aux élèves ayant poursuivi des études universitaires d'un minimum de 7 semestres et demi à huit semestres. Les études entreprises peuvent prendre la forme soit d'une préparation à un diplôme universitaire, accompagnée parallèlement d'une préparation au certificat d'enseignant, soit d'une préparation au diplôme de "maître de gymnase". Ces cours comprennent une période de formation pédagogique théorique et pratique. Les élèves-professeurs obtiennent soit une licence soit un doctorat. Les professeurs d'enseignement commercial peuvent suivre des cours de "capacité à l'enseignement commercial" dans les facultés des sciences économiques et sociales et à l'université de St Gall. Les conditions d'obtention du diplôme sont similaires à celles requises pour le titre de "maître de gymnase".

Les problèmes de formation pédagogique des enseignants de l'enseignement secondaire faisant actuellement l'objet de discussions et de réformes, on peut citer quelques exemples de plan d'études. A Berne, le certificat d'aptitude à l'enseignement secondaire n'est délivré au futur enseignant que si celui-ci a suivi un cours de didactique et de pratique sur la (ou les) matière (s) principale (s) de sa licence ; ce cours dure 10 semaines et peut être entrepris avant la fin du 4ème semestre de licence. De plus, les futurs enseignants doivent attester qu'ils ont suivi un stage pratique de six semaines, sous la direction d'un conseiller pédagogique, stage qu'ils ne peuvent entreprendre avant la fin du 5ème semestre de licence.

A Fribourg le stage pratique a la même durée ; on passe des examens oraux et écrits de pédagogie et le futur enseignant doit également faire un cours intéressant l'enseignement du 1er et du 2ème cycle. Le titre de "maître de gymnase" est accordé à ceux qui réussissent les examens.
A Neuchâtel, le stage dure 2 mois (sous la direction d'un directeur de stage attaché au "département de l'instruction publique" du canton) et les cours de pédagogie, à l'université, durent deux semestres. Là aussi, l'élève-professeur doit faire un cours, à titre d'examen pratique, les examens de pédagogie étant passés en même temps que ceux de licence.
Les universités de Lausanne et de Genève ont mis sur pied une formation pédagogique faisant suite aux études de licence et intégrant la formation pédagogique théorique et les stages pratiques. A Lausanne, cette formation dure 1 année comprenant des cours théoriques, des séminaires de didactique spéciale (1 semestre) et les stages pratiques (10-12 heures par semaine).
A Genève, cette formation est étalée sur 2 années, elle comprend à la fois des cours de formation stricto sensu et des suppléances dans les écoles, contre indemnité. Ces suppléances sont plus restreintes en première qu'en seconde année. Au cours de la première année, il y a beaucoup plus de cours de formation méthodologique et pédagogique. Des maîtres de stage dirigent des stages pratiques. En seconde année, des maîtres d'application surveillent les suppléances des élèves-professeurs.

4. Enseignants des matières spéciales (non académiques)

Des dispositions spéciales règlent la formation des autres catégories d'enseignants (maîtres de dessin, de travaux pratiques, de musique, d'enseignement ménager, etc).

(a) Les maîtresses d'enseignement ménager suivent les cours des écoles normales d'enseignement ménager où elles entrent en général à l'âge de 16 ans/17 ans après avoir suivi soit l'enseignement primaire supérieur ou l'enseignement secondaire inférieur, soit une école d'enseignement ménager faisant immédiatement suite à l'enseignement primaire supérieur. Les cours de formation durent de 2 ans 1/2 à 3 ans. L'école normale d'enseignement ménager peut également former les enseignantes des écoles professionnelles, (Canton du Tessin). Ou ces dernières peuvent suivre des cours de formation dans une école normale spécialisée (Canton de Zurich).

(b) Les maîtres de dessin, de musique ou de chant sont soit des instituteurs qui se spécialisent en suivant des cours spécifiques d'écoles normales ou de conservatoire (exemple un an d'études spéciales après les 2 années de formation de base d'instituteur primaire à Bâle-ville) soit des diplômés des conservatoires ou écoles artistiques qui reçoivent ensuite une formation pédagogique.

(c) La formation du corps enseignant des écoles complémentaires professionnelles et des écoles-ateliers de niveau secondaire varie selon qu'il s'agit de l'enseignement des branches générales ou des branches professionnelles.

- Les futurs professeurs à temps complet de culture générale suivent un cours de formation d'une année. Ce dernier comprend, outre un enseignement de type traditionnel des matières théoriques une formation en atelier, un stage dans des entreprises industrielles et un stage comme professeur-assistant sous le contrôle d'un professeur expérimenté. Cette formation spécialisée est, en général, donnée à des enseignants de l'enseignement primaire et secondaire ou à des licenciés d'université. Un brevet sanctionne l'année de formation. Il permet d'être nommé professeur de branches générales à temps complet de l'enseignement professionnel.

Comme on est obligé de recruter des enseignants du primaire et du secondaire ou des diplômés de l'enseignement supérieur sans avoir la possibilité de leur donner une formation aussi longue, on organise à leur intention, un cours d'initiation et de perfectionnement aux particularités de l'enseignement professionnel d'une durée, chacun, d'une à deux semaines.

- Les futurs professeurs des branches professionnelles (théoriques et pratiques) sont recrutés parmi les ingénieurs diplômés, les techniciens supérieurs, les artisans titulaires du diplôme de maîtrise. L'objectif principal du cours de formation est de donner une formation pédagogique et méthodologique à des personnes qui sont pleinement compétentes dans leur métier ou profession sur le plan technique. Aussi le cours d'initiation pédagogique à temps partiel est-il de courte durée (au moins 30 heures). Ces cours sont en général donnés le soir, dans les limites d'un canton ou même d'une école. (Bien qu'ils n'entrent pas dans le cadre de cette description, il faut remarquer que les enseignants des "technikums"-(enseignement technique supérieur non-universitaire)-peuvent être assimilés à ceux du gymnase ; ce sont en général des ingénieurs dont le traitement est assez élevé).

CHAPITRE II : FORMATION ET PROBLEMES DE RECRUTEMENT

Les difficultés de recrutement auxquelles les différentes autorités cantonales ont eu à faire face, depuis quelques années, ont directement ou indirectement rejailli sur la formation des enseignants.

Indirectement, en ce qui concerne la formation des instituteurs primaires, par le report à une date ultérieure de la prolongation des études dans les écoles normales (c'était le cas du canton de St. Gall en 1961/62 et du canton de Soleure en 1963 pour la prolongation de 4 à 5 années des études).

Directement, par une certaine diminution de la formation théorique au profit de stages pratiques pendant lesquels les futurs instituteurs enseignent, faute de maîtres qualifiés. Ainsi, à Berne, les élèves-maîtres (en 1961/62) ont tenu des classes pendant un semestre et certains d'entre eux se sont présentés aux examens après trois ans et demi d'études, au lieu de quatre. A St. Gall (en 1961/62) on a réduit à trois semestres au lieu de 4 la durée des études des enseignants des écoles secondaires (inférieures). Néanmoins, lorsqu'ils sont envoyés dans des postes vacants, les élèves-maîtres sont encadrés par des maîtres expérimentés et des inspecteurs. La situation de pénurie n'a pas toujours permis de maintenir les conditions de recrutement. Ainsi, à Genève, on a supprimé, afin d'élargir le recrutement, le concours d'admission qui comprenait des épreuves de chant, de sport et des causeries devant les élèves, permettant parfois de détecter les aptitudes à l'enseignement des candidats. Maintenant, les personnes ayant les titres requis peuvent suivre immédiatement la première année d'études.

Les autres mesures qui ont été prises intéressent la formation d'urgence. On peut faire une distinction entre deux catégories de candidats : ceux qui possèdent le certificat de maturité et ceux qui possèdent une formation professionnelle complète (école de commerce, apprentissage). Les premiers ont une formation générale répondant aux besoins et doivent donc recevoir une formation pédagogique. Cette dernière dure de 6 mois (Soleure - St. Gall) à un an (Berne, Lucerne, Vaud) selon les cantons, les titulaires de la maturité étant acceptés dans la dernière ou les deux dernières années de l'école normale. Il faut noter qu'outre les titulaires de la "maturité", le canton de Neuchâtel a offert la possibilité aux titulaires de la "maturité commerciale" de suivre des cours accélérés et spécifiques à l'école normale. Pour la seconde catégorie de candidats, on a créé des cours spéciaux, de durée variable, selon la formation antérieure. En général, cette formation s'étend sur deux années deux années et demi. Les candidats qui peuvent avoir entre 25 et 35 ans (et même plus si leur qualification le leur permet) sont d'abord sélectionnés. Ainsi à Berne, l'examen d'admission consiste en un entretien d'une demie heure avec trois personnalités différentes, puis en une épreuve de langue maternelle et de calcul. A Bâle-ville, la formation comprend pendant 3 semestres, un cours du soir préparatoire, puis un cours principal de deux ans. Dans certains cantons un cours de perfectionnement est obligatoire pour ces instituteurs diplômés. D'autres conditions, parachevant cette formation accélérée, peuvent être imposées. Ainsi à Zurich, les maîtres ayant bénéficié de la formation accélérée, ne peuvent continuer leurs études en vue d'obtenir un diplôme de professeur de l'enseignement secondaire. Dans quelques cantons ces enseignants sont tenus de rester dans le même poste pendant au moins deux ans ; s'ils y ont fait preuve de compétence, ils sont intégrés dans le personnel enseignant régulier. Le diplôme obtenu après une formation accélérée place son titulaire sur un pied d'égalité avec le diplômé de l'école normale, du point de vue statut, rémunération et sécurité sociale. Enfin, il faut signaler qu'en 1966, on a mis sur pied, en Thurgovie, un cours de formation accélérée pour les "maîtresses d'ouvrages".

Au niveau de l'enseignement primaire on tend donc actuellement à aller vers une législation exigeant 5 années de formation à l'école normale d'instituteurs. En ce qui concerne les enseignants de l'école secondaire (au niveau du 1er cycle de l'enseignement secondaire), des voix se sont élevées en faveur d'une prolongation de leur formation au-delà des deux années requises en général. Ainsi à Zurich dès 1961, le corps enseignant avait proposé de prolonger cette formation afin de permettre une meilleure préparation.

Comme dans le cas de l'enseignement primaire, ce type de réforme a dû être ajourné vu la période de pénurie en enseignants traversée par la Suisse.

Au niveau de l'enseignement secondaire supérieur, c'est la formation pédagogique des enseignants qui a fait l'objet de l'attention des autorités scolaires. Mais à un moment où l'on est parfois obligé d'accepter dans l'enseignement des enseignants licenciés ou docteurs, sans formation pédagogique, il est difficile de modifier la formation en allongeant par exemple la durée des études. D'autant plus que certaines autorités ont été amenées à accepter l'intégration dans les cadres du personnel enseignant secondaire de ce personnel, les conditions variant toutefois d'un canton à l'autre. A Genève et à Lausanne, on a tenté de trouver une solution en combinant la formation psychopédagogique avec un poste d'enseignant à mi-temps pendant deux ans. Compte tenu de cette situation, il apparaît que l'un des remèdes à l'insuffisance de la formation pédagogique des enseignants est de développer les cours de perfectionnement.

C'est en particulier dans cette direction que s'orientent les autorités scolaires responsables de l'emploi et de la formation des enseignants de l'enseignement technique. Compte tenu de la pénurie d'enseignants, il n'était pas question de généraliser les propositions faites, il y a quelques années par l'Union Suisse pour l'enseignement professionnel et l'Association des Ecoles professionnelles de Suisse, à l'Office fédéral de l'industrie, des arts et métiers et du travail. Le mémorandum proposait en effet de porter à deux semestres en moyenne (au lieu de 30 heures actuellement) la formation des enseignants des branches professionnelles (tout en faisant finalement dépendre la durée de la formation des études et de l'expérience antérieures). Une autre proposition visait à former les enseignants des branches générales en 3 semestres dont : un consacré à la formation pédagogique et à un stage dans l'industrie. Un institut central aurait été chargé de la formation et du perfectionnement de ces enseignants, ainsi que de la recherche en ce domaine. Dans l'impossibilité de mettre en oeuvre immédiatement cette réforme, on a développé les cours de perfectionnement. Il est intéressant de noter que les cantons peuvent astreindre les enseignants à suivre ces cours de perfectionnement (article 27 de la nouvelle loi fédérale sur la formation professionnelle).

En conclusion, il apparaît que pour la formation des enseignants "primaires" tout au moins, les cantons qui ont surmonté les crises de recrutement ne procèdent pas immédiatement à une prolongation de la formation dans la mesure où l'on réfléchit actuellement sur la restructuration complète des études dans les écoles normales. Or cette restructuration, qui viserait à accentuer l'évolution antérieure caractérisée par la création d'un cycle inférieur et d'un cycle supérieur de formation est indirectement liée à la politique qui pourrait être mise en oeuvre en matière de regroupement scolaire. En effet, le développement d'unités scolaires plus grandes, au niveau de la scolarité obligatoire, et en particulier du premier cycle, offrant aux élèves une large gamme d'options, permettrait d'utiliser des enseignants spécialisés qui seraient formés dans les nouveaux cycles supérieurs à développer ou à créer, dans les écoles normales.

CHAPITRE III : LES DIFFICULTES DE RECRUTEMENT

Depuis un certain nombre d'années, les autorités des divers cantons suisses ont eu du mal à équilibrer l'offre et la demande d'enseignants.

1. Facteurs d'accroissement de la demande d'enseignants

L'accroissement de la natalité après la seconde guerre mondiale a rejailli sur la population d'âge scolaire correspondant à la scolarité obligatoire, jusqu'aux environs de 1955/56. La croissance démographique s'est ensuite stabilisée en ce qui concerne le groupe d'âge 6-11 ans. Le groupe d'âge 11-15 ans s'est accru logiquement jusqu'en 1960 pour se stabiliser ensuite. C'est pendant la période 1960/65 que le groupe d'âge 16-19 ans a le plus progressé. Le tableau ci-dessous résume l'évolution démographique (indice 100 en 1950).

TABLEAU 1
EVOLUTION DES GROUPES D'AGE CORRESPONDANT A LA PERIODE D'ENSEIGNEMENT PRIMAIRE ET SECONDAIRE

Groupe d'âge	1950	1955	1960	1965
6 - 11	100	122	119	125
12 - 15	100	109	136	135
16 - 19	100	95	112	146

Mais, dans la réalité, les accroissements de population d'âge scolaire ont beaucoup varié d'un canton à l'autre à cause de l'importance des migrations intérieures.

A côté des phénomènes purement démographiques, les phénomènes institutionnels ont également joué un grand rôle. Un certain nombre de cantons ont prolongé la durée de la scolarité obligatoire et ont développé les équipements scolaires au niveau du premier cycle de l'enseignement secondaire ainsi que les facilités d'accès à cet enseignement. La demande d'enseignement au niveau de l'enseignement secondaire supérieur s'est considérablement accrue. L'absence de statistiques sures en ce qui concerne les divers types d'enseignement technique et professionnel ne permet pas de citer des chiffres de croissance, mais cette dernière est certaine. Ainsi, à la suite de l'importante campagne menée en faveur de l'enseignement professionnel les contrats d'apprentissage en cours sont passés de 78.471 en 1951 à 131.879 en 1965.

Au total si l'on regroupe les niveaux et types d'enseignement correspondant grossièrement à la période de scolarité obligatoire - cette dernière n'est pas uniforme en Suisse - soit l'enseignement primaire, l'enseignement dit "secondaire" et l'enseignement "moyen inférieur" (soit deux types d'enseignement correspondant à un premier cycle d'enseignement secondaire) on constate un fort accroissement pendant la période 1950/55. C'est principalement pendant la période 1955/65 que les effectifs de l'enseignement général du second cycle (écoles supérieures de jeunes filles et gymnases) se sont rapidement accrus.

TABLEAU 2

EVOLUTION DES EFFECTIFS DE L'ENSEIGNEMENT PRIMAIRE ET SECONDAIRE (GENERAL)

Années Type d'enseignement	1951/52	1956/57	1961/62	1964/65
Enseignement primaire et enseignement secondaire général (1er cycle)	100	120	125	122
Enseignement secondaire général (2ème cycle)	100	123	197	243
Enseignement commercial et d'administration (2ème cycle) : diplôme de "maturité" (cantonale)	100	106	132	159

2. Problèmes soulevés par l'offre d'enseignants

L'enseignement étant de la responsabilité de chaque canton, dans une conjoncture de développement et de mutations économiques, la faible harmonisation des politiques de recrutement entre les cantons peut être un handicap.

Les phénomènes démographiques ont joué un rôle important dans l'offre d'enseignants. Les enseignants à partir des années 50 ont été recrutés dans des classes creuses au moment où il convenait de scolariser des classes d'âge beaucoup plus larges.

Au sein même de chaque canton, on a eu de plus en plus de difficulté à pourvoir les postes d'enseignants dans les régions éloignées et montagneuses. Les enseignants ont recherché les postes situés dans les villes. Il apparaît de plus en plus difficile, au niveau primaire, de trouver les enseignants de sexe masculin, désignés pour certains postes. Il apparaît que la conjoncture économique florissante de ces dernières années a offert aux jeunes gens des professions plus attrayantes. Cette situation prévaut également au niveau secondaire et atteint non seulement les enseignants des matières scientifiques et techniques mais également certaines catégories de professeurs des matières littéraires.

La recherche de gains plus élevés a conduit certains enseignants des niveaux d'enseignement inférieurs (primaire par exemple) à poursuivre leurs études afin d'obtenir un poste à un niveau d'enseignement plus élevé et plus rémunérateur.

Ce qui est plus profondément, en cause c'est la diminution du "prestige social" de l'enseignant. La profession offre moins d'attrait que d'autres car les possibilités d'avancement, sont très faibles (les postes de directeur sont peu nombreux) ; la carrière enseignante n'apparaît pas assez attrayante et variée, comparée à celle d'autres professions. Au point de vue statut économique, les enseignants des gymnases, par exemple, voient leur traitement maximum atteint au bout de 10 ans ; aucun avantage matériel ne distingue l'enseignant dynamique de l'enseignant routinier.

L'offre de personnel enseignant est également freinée par des législations cantonales exigeant que les enseignantes démissionnent à leur mariage. Malgré quelques exceptions, l'emploi des enseignantes mariées n'a pas conduit à un développement systématique des postes à mi-temps.

Aussi la féminisation du corps enseignant a-t-elle peu évolué au cours de la période 1950-1960 comme le montre le tableau ci-dessous

TABLEAU 3

POURCENTAGE D'ENSEIGNANTES (CORPS ENSEIGNANT REGULIER)

Type d'écoles Années	Ecoles primaires	Ecoles secondaires	Ecoles moyennes inférieures	Ecoles moyennes supérieures	Ecoles de commerce
1951/52	40	12	12	16	14
1956/57	42	12	12	16	21
1961/62	43	11	15	15	19

Source : Tableau I (annexe statistique)

Au niveau de l'enseignement secondaire supérieur, le pourcentage d'enseignantes est faible dans l'ensemble des matières mais principalement dans les matières scientifiques comme on peut le constater dans le tableau suivant :

TABLEAU 4

POURCENTAGE D'ENSEIGNANTES PAR GRAND GROUPE DE DISCIPLINES DANS LES ECOLES SECONDAIRES SUPERIEURES

	1950	1955	1960
Gymnases			
Lettres	7 %	6	9
Sciences	3	3	5
Commerce	-	-	-
Ecoles de commerce			
Lettres	19	20	19
Sciences	-	-	-
Commerce	13	15	11
Ecoles normales			
Lettres	32	29	32
Sciences -commerce	21	21	22

Source : Tableau 45 (Annexe statistique) du rapport de la Commission fédérale pour l'étude des problèmes de relève dans le domaine des sciences morales, des professions médicales et des maîtres d'école moyenne.

En tout état de cause, l'augmentation du personnel enseignant féminin au niveau de l'enseignement secondaire, ne peut être entrepris sans une augmentation sérieuse du nombre des jeunes filles faisant des études secondaires menant à l'université. En 1962/63, les étudiantes ne représentaient que 17,7 % des effectifs à l'université. De plus, ces nouvelles étudiantes devraient être mieux réparties entre les diverses facultés, si l'on désire, par exemple, faire face aux besoins d'enseignants des matières scientifiques. En effet en 1962/63 si les étudiantes ne représentaient que 43,8 % de l'ensemble des étudiants en lettres, elles ne représentaient plus que 12,9 % des effectifs des facultés des sciences et 0,4 % des élèves inscrits dans les sciences de l'ingénieur.

Mais ce sont les différences de traitements entre cantons qui ont eu tendance à créer le plus de difficulté au cours des dernières années. A titre d'exemple, on peut citer les variations de traitements des instituteurs et des professeurs de gymnases (mariés et père de 2 enfants) selon les cantons. Ces données, au 1er juillet 1961, sont citées à titre d'information, des modifications ayant été apportées depuis car les enseignants recherchaient dès la fin de leur formation des postes dans les cantons offrant les traitements les plus élevés.

On constatait donc que les traitements des instituteurs (classes primaires ordinaires) mariés et pères de deux enfants se répartissaient dans les catégories suivantes :

a. Traitement initial :

1 canton, pour l'école de six mois	- 6.368	fr.
3 cantons entre	10.000 et 10.999	fr.
11 cantons entre	11.000 et 11.999	fr.
5 cantons entre	12.000 et 12.999	fr.
5 cantons entre	13.000 et 13.999	fr.

b. Traitement final (avec toutes les annuités de service) :

1 canton à	8.222 fr.
1 canton entre	12.000 et 12.999 fr.
3 cantons entre	13.000 et 13.999 fr.
4 cantons entre	14.000 et 14.999 fr.
7 cantons entre	15.000 et 15.999 fr.
1 canton entre	16.000 et 16.999 fr.
4 cantons entre	17.000 et 17.999 fr.
2 cantons entre	18.000 et 18.999 fr.
2 cantons entre	20.000 et 20.999 fr.

Quant aux traitements des maîtres des gymnases (enseignement secondaire supérieur), dans les mêmes conditions de famille, ils se répartissaient ainsi :

a. Traitement initial :

1 canton	12.000 à 12.999 fr.
3 cantons	15.000 à 15.999 fr.
2 cantons	16.000 à 16.999 fr.
7 cantons	17.000 à 17.999 fr.
5 cantons	18.000 à 18.999 fr.
1 canton	19.000 à 19.999 fr.
1 canton	20.000 à 20.999 fr.

b. Traitement final :

1 canton	15.000 à 15.999 fr.
1 canton	18.000 à 18.999 fr.
1 canton	19.000 à 19.999 fr.
2 cantons	20.000 à 20.999 fr.
3 cantons	21.000 à 21.999 fr.
4 cantons	22.000 à 22.999 fr.
1 canton	25.000 à 25.999 fr.
1 canton	26.000 à 26.999 fr.
1 canton	28.000 à 28.999 fr.

Au 1/10/1965, pour une vingtaine de cantons, on avait la répartition suivante des traitements pour les enseignants célibataires (indemnités diverses non comprises).

Les traitements de base initiaux des instituteurs étaient les suivants :

3 cantons	11.000 à 11.999 fr.
3 cantons	12.000 à 12.999 fr.
5 cantons	13.000 à 13.999 fr.
4 cantons	14.000 à 14.999 fr.
1 canton	15.000 à 15.999 fr.
3 cantons	16.000 à 16.999 fr.
1 canton	17.000 à 17.999 fr.

Les salaires de base (traitement final) se répartissaient ainsi :

1 canton	14.000 à 14.999 fr.
1 canton	15.000 à 15.999 fr.
2 cantons	16.000 à 16.999 fr.
2 cantons	17.000 à 17.999 fr.
4 cantons	18.000 à 18.999 fr.
3 cantons	19.000 à 19.999 fr.
3 cantons	20.000 à 20.999 fr.
3 cantons	23.000 à 23.999 fr.
1 canton	24.000 à 24.999 fr.

Les traitements de base initiaux des enseignants de l'enseignement secondaire supérieur étaient les suivants dans 17 cantons :

2 cantons	18.000 à 18.999 fr.
1 canton	20.000 à 20.999 fr.
2 cantons	21.000 à 21.999 fr.
4 cantons	22.000 à 22.999 fr.
4 cantons	22.000 à 23.999 fr.
3 cantons	24.000 à 24.999 fr.
1 canton	25.000 à 25.999 fr.

Les salaires de base (traitement final) se répartissaient ainsi :

1 canton	24.000 à 24.999 fr.
2 cantons	25.000 à 25.999 fr.

4 cantons	27.000 à 27.999 fr.
3 cantons	28.000 à 28.999 fr.
3 cantons	29.000 à 29.999 fr.
3 cantons	30.000 à 30.999 fr.
2 cantons	31.000 à 31.999 fr.
1 canton	33.000 à 33.999 fr.

Les différences de traitement ne se rencontrent pas seulement entre cantons. Il en existe également entre villes et communes.

De plus, il existe une discrimination vis-à-vis des enseignantes qui dans un certain nombre de cantons, touchent un traitement inférieur à celui des enseignants.

On a vu que certaines législations cantonales exigeaient la démission de l'enseignante qui se marie, de plus certains cantons ont des échelles de traitement différentes pour les hommes et pour les femmes. Au 1/10/1965 les enseignantes n'obtiennent un salaire égal au salaire des enseignants que dans 8 cantons environ. En ce qui concerne le traitement des institutrices célibataires (sans indemnité) on constate que sur 13 cantons environ, 5 cantons maintiennent pendant toute la carrière l'écart existant au début de carrière ; dans les 8 autres cantons, cet écart entre les salaires féminins et masculins s'accroit.

TABLEAU 5

ECART DE TRAITEMENT ENTRE INSTITUTRICES ET INSTITUTEURS

	Différence de traitement de base entre institutrices et instituteurs (fr. suisse)		Traitement féminin par rapport au traitement masculin (% salaire minimum)
	Salaire minimum	Salaire maximum	
Cantons où l'écart entre le traitement minimum et maximum reste le même			
1.	1.854	1.854	86
2.	2.070	2.070	83
3.	891	891	92
4.	826	826	95
5.	826	826	95
Cantons où l'écart entre le traitement minimum et maximum s'accroît			
6.	686	956	95
7.	2.023	2.878	87
8.	1.012	1.439	94
9.	421	1.959	97
10.	1.163	1.561	93
11.	439	878	97
12.	1.090	1.308	93
13.	851	1.475	94

Sur les 13 différences de traitement recensées, on constate, que le traitement de début des femmes représente moins de 85 % de celui des hommes dans 1 cas, 86 à 90 % dans 2 cas, 91 à 95 % dans 8 cas et plus de 95 % dans 2 cas.

Dans l'enseignement secondaire supérieur sur 6 exemples de salaires inégaux, on constate que dans 1 cas le salaire de femmes représente 85 % de celui des hommes dans 2 cas la différence se situe entre 86 et 90 % et dans 3 cas entre 91 et 95 %. Dans un cas l'écart absolu reste le même entre le salaire minimum et le salaire maximum ; dans un cas cet écart diminue, dans les 4 autres cas l'écart s'accentue.

3. Mesures prises pour augmenter le recrutement des enseignants

- En dehors de mesures telles que le report de la prolongation de la scolarité dans les écoles normales primaires, on a augmenté la capacité d'accueil des écoles normales où à côté des élèves recrutés selon la législation en vigueur, on a donné à des élèves-maîtres une formation accélérée. Le recrutement des écoles normales est passé, ainsi, de l'indice 100 en 1950 à l'indice 148 en 1955. Le total des élèves-maîtres inscrits continue à augmenter, passant de l'indice 100 en 1961 à l'indice 151 en 1964. Le nombre de diplômes d'instituteurs des classes primaires délivré de 1950 à 1965 serait passé de l'indice 100 en 1950 à l'indice 253 en 1965. Il semble par contre que pendant la période 1955-1965, les diplômés destinés aux maîtres de l'enseignement secondaire du premier cycle(primaire supérieur, secondaire inférieur) et que la statistique a pu individualiser, n'ont augmenté que dans une proportion d'un quart/un cinquième reflétant en cela, la stagnation du nombre des élèves de ce niveau d'enseignement pendant le même laps de temps.

- On a fait appel, rarement dans l'enseignement primaire plus souvent dans l'enseignement secondaire, à un personnel sans formation pédagogique. Bien que la notion de personnel auxiliaire ne recouvre pas celle de personnel non-qualifié (le personnel auxiliaire peut être aussi engagé là où il n'existe pas de poste à plein-temps, et là où des qualifications spéciales sont réclamées le pourcentage de ce personnel par rapport au total des enseignants (maîtres réguliers et maîtres auxiliaires), donne une première indication des difficultés de recrutement.

TABLEAU 6
POURCENTAGE DE PERSONNEL AXILIAIRE PAR RAPPORT AU TOTAL DES ENSEIGNANTS

Type d'école / Années	Ecoles primaires	Ecoles secondaires	Ecoles moyennes inférieures	Ecoles moyennes supérieures	Ecoles de commerce
1951/52	6(a)	-	-	16(b)	32(a)
1956/57	8(a)	-	-	22(b)	21(a)
1961/62	10(d)	10(a)	35(a)	35(a)	32(a)

Sources : (a) tableau I : annexe statistique
(b) tableaux 45 et 46 annexe statistique du Rapport de la Commission fédérale pour l'étude des problèmes de relève dans le domaine des sciences morales, des professions medicales et des maîtres d'école moyenne (1963 - Département Fédéral de l'Intérieur).

L'augmentation du pourcentage des maîtres auxiliaires a eu le mérite d'éviter une aggravation du rapport maître/élève au moment où le recrutement des enseignants était devenu difficile. Compte tenu des réserves que l'on peut faire sur la définition des maîtres auxiliaires (certains sont employés à mi-temps) le nombre d'élèves/maîtres a évolué ainsi dans l'enseignement primaire :

1951/52 : 31
1953/54 : 32
1956/57 : 31
1959/60 : 30
1961/62 : 29

Mais ce chiffre d'élève par maître au niveau national cache de profondes différences entre les cantons.

- Si l'âge de la retraite n'a pas été retardé, on a, néanmoins, rengagés des enseignants déjà à la retraite ou on a maintenu en fonction ceux qui pouvaient faire valoir leur droit à la retraite. Le statut de ces titulaires a fait l'objet de dispositions spéciales.

- Malgré la législation de certains cantons, obligeant les enseignantes à quitter leur profession lors de leur mariage on procède à des réengagements ou on maintient ces enseignantes en fonction ; on tend actuellement à leur offrir un statut équivalent à celui des enseignantes titulaires non mariées (traitement - assurance). Certains cantons (comme à Neuchâtel) ont modifié leur législation et permettent aux institutrices mariées d'être régulièrement titularisées.

Afin de maintenir en poste les enseignants, en particulier dans les zones rurales, des allocations spéciales sont parfois attribuées aux instituteurs de village. Leur logement a été amélioré.

On a signalé les obligations auxquelles étaient soumis les diplômés des cours de formation accélérée d'instituteurs. Il convient d'ajouter que deux cantons (Berne, St. Gall) ont introduit une obligation d'enseigner dans leur canton pour les élèves-maîtres terminant leurs études normales. En 1961/62, les inspecteurs primaires du Tessin avaient proposé de n'autoriser une nomination dans les villes qu'après quelques années de service dans les zones rurales et alpestres.

- Au total pour l'enseignement primaire, en 1955/56 pour un chiffre de 16.335 enseignants, 546 classes n'étaient pas tenues par des titulaires (234 à Genève, 122 à Neuchâtel, 190 dans le reste de la Suisse) ; 410 suppléants ne possédaient pas les titres spécifiquement requis. Parmi le corps enseignant qualifié, environ 160 retraités étaient maintenus en fonction. En 1961, aux 18.391 enseignants titulaires, s'ajoutaient 255 retraités, 304 étudiants, 114 auxiliaires étrangers et 6 postes restaient vacants.

4. Le recrutement des professeurs de l'enseignement secondaire supérieur

L'enquête qui a été menée sur les perspectives de recrutement des professeurs de l'enseignement secondaire supérieur (commission fédérale pour l'étude des problèmes de relève dans le domaine des sciences morales, des professions médicales et des maîtres d'écoles moyennes) a conclu qu'il était "vraisemblable que les besoins en maîtres de gymnase pourront à peine être couverts" d'ici 1975. Il apparaît peu probable, aux yeux de la commission que dans un prochain avenir, les besoins d'enseignants, à ce niveau puissent être réellement dépassés par une offre importante. D'autant plus que toute augmentation de l'offre devrait immédiatement être employée à améliorer les conditions de travail amélioration des rapports maître/élèves et élèves/classe), diminution des horaires de travail, etc.). Car l'offre suffisante et régulière d'enseignants est indirectement déterminée par l'amélioration des conditions de travail. Un certain nombre de postes sont aatuellement occupés par des "maîtres auxiliaires" dont le nombre a fortement progressé, or la moitié d'entre eux ne possèdent pas de brevet d'enseignement officiel. Compte tenu de l'évolution récente des effectifs, il conviendrait d'estimer l'offre et la demande future d'enseignants à ce niveau à partir d'une hypothèse de croissance des effectifs scolaires conduisant à un accroissement du déficit en enseignant, et en particulier dans les disciplines littéraires comme l'indique le tableau ci-après.

TABLEAU 7

ESTIMATION DU DEFICIT EN ENSEIGNANTS, PAR GRANDS GROUPES DE DISCIPLINES DANS LES ECOLES SECONDAIRES SUPERIEURES (ECOLES MOYENNES SUPERIEURES, ECOLES NORMALES PRIMAIRES ET ECOLES DE COMMERCE

	1965	1970	1975
Besoins			
Lettres	2.119	2.696	3.236
Sciences	925	1.210	1.462
Commerce	257	278	319
Total	3.301	4.184	5.017
Offre			
Lettres	1.638	1.926	2.419
Sciences	674	792	993
Commerce	225	248	294
Total	2.537	2.966	3.706
Déficit			
Lettres	481	770	817
Sciences	251	418	469
Commerce	32	30	25
Total	764	1.218	1.311

Source : Tableau 56 du rapport de la Commission Fédérale pour l'étude des problèmes de relève dans le domaine des sciences morales, des professions médicales et des maîtres d'école moyenne (hypothèse d'évolution irrégulière du taux de scolarisation).

Les écoles normales ont en particulier recours à ces enseignants auxiliaires (en sciences et en lettres) car le nombre de leçons n'est pas assez important pour qu'un ou plusieurs maîtres réguliers se consacrent entièrement à ces disciplines. Cette situation se rencontre également dans les disciplines qui sortent de la spécialisation de l'école. Ainsi il y a beaucoup de maîtres auxiliaires de sciences dans des écoles de commerce et de maîtres auxiliaires de commerce dans les gymnases (voir tableau ci-après).

TABLEAU 8

POURCENTAGE D'AUXILIAIRES ENSEIGNANTS PAR GRANDS GROUPES DE DISCIPLINES DANS LES ECOLES SECONDAIRES SUPERIEURES

	1950	1955	1960
Gymnases			
Lettres	16	15	18
Sciences	15	23	28
Commerce	26	30	30
Ecoles de commerce			
Lettres	27	24	26
Sciences	31	28	39
Commerce	27	23	25
Ecoles normales			
Lettres	37	45	44
Sciences - commerce	32	38	46

Aussi est-il intéressant de noter les recommandations faites par la commission d'enquête quant aux futures conditions de recrutement des enseignants de ce niveau.

5. Recommandations intéressant plus particulièrement le recrutement des professeurs de l'enseignement secondaire supérieur

Le rapport de la commission fédérale pour l'étude des problèmes de relève dans le domaine des sciences morales, des professions médicales et des maîtres d'école moyenne (1963) a fait un certain nombre de recommandations en vue de remédier au manque d'enseignants dans l'enseignement secondaire supérieur (gymnases, écoles de commerce, écoles normales).

- Il convient de souligner que la première recommandation a trait au relèvement des taux de scolarisation du niveau de l'enseignement secondaire grâce à la réduction des inégalités d'origine géographique et sociale. L'augmentation du nombre des élèves au niveau secondaire, pourra ainsi se répercuter au niveau universitaire, plus d'étudiants pouvant ainsi se diriger vers l'enseignement.

- Cette orientation vers l'enseignement ne pourra être obtenue qu'à condition que des statistiques claires mettent l'accent sur les besoins en enseignants et sur les mesures tant quantitatives que qualitatives qu'il conviendrait de prendre au niveau de l'enseignement secondaire.

- Le groupe de recommandations suivant a trait à l'amélioration de l'ensemble du statut de l'enseignant. Les conditions de travail devraient être améliorées par la réduction du nombre d'heures d'enseignement exigé (26-30 leçons par semaine dans le 1er cycle, 22-28 dans le second ; il y a de 2 à 4 semaines de vacances) et la diminution de l'effectif des élèves par classe. Ceci permettrait à l'enseignant de se livrer à des travaux personnels d'assister à des cours de perfectionnement. Il conviendrait de développer les congés "sabbatiques" d'une année ou d'une demie année, après un certain nombre d'années d'enseignement ce que deux ou trois cantons ont déjà rendu légal. La diminution des tâches d'enseignement dans l'enseignement secondaire permettrait encore d'être assistant à l'université ou de faire de la recherche dans l'industrie. Ceci suppose également que les conditions de travail dans certaines écoles soient améliorées (bibliothèque d'étude, diminution des tâches administratives et secondaires, etc.). Les traitements devraient être fixés de façon à éviter que les jeunes étudiants partent vers des professions plus rémunératrices. De plus, les différences de traitements devraient diminuer d'un canton à l'autre. Il conviendrait également d'introduire plus de différenciation dans l'échelle des traitements afin de développer les perspectives de promotion (adaptation du traitement en fonction du travail accompli, variation compte tenu des qualifications, diminution des charges des maîtres au fur et à mesure du déroulement de la carrière).

Enfin, les universités devraient beaucoup plus encourager et conseiller les éléments qui apparaissent doués pour l'enseignement, à s'engager dans cette carrière au niveau secondaire. Ces différentes mesures auraient l'avantage de renforcer "le prestige social" de la profession et donc de susciter plus de vocations.

– Dans le même ordre d'idées, le rapport suggère de faire plus de propagande au sein de l'école sur la carrière enseignante, de "dépister" dès l'enseignement secondaire les élèves qui pourraient réussir dans l'enseignement, d'utiliser éventuellement, à cette fin, l'orientation professionnelle scolaire et universitaire. Il est évident que, parfois, l'exemple même de l'enseignant au sein de sa classe grâce à son dynamisme propre, sous-tendu par un statut rénové, peut être le meilleur instrument de propagande.

Enfin, en dehors même de l'accroissement quantitatif derecrutement grâce à une expansion globale du système d'enseignement, il serait nécessaire de faire appel à des enseignantes à plein temps et à mi temps, ce qui nécessite la modification des législations interdisant l'emploi des femmes mariées dans l'enseignement et implique la création de postes à mi-temps et la mise en application du principe de l'égalité des salaires. Il conviendrait également de faire appel à des retraités, à des personnes exerçant une autre activité (en favorisant par exemple les cours du soir ou par correspondance permettant d'atteindre les qualifications minima requises). Enfin, dans les limites précises et à des conditions très étudiées, on pourrait encourager les maîtres de l'enseignement primaire à poursuivre des études universitaires en leur faisant passer des examens d'équivalence avec la maturité et des étudiants en cours d'études universitaires pourraient, s'ils sont judicieusement choisis et encadrés donner un nombre limité d'heures de cours.

Remarque finale :

Les recommandations énumérées au-dessus et qui intéressent en premier lieu l'enseignement secondaire supérieur peuvent également s'appliquer aux autres niveaux et types d'enseignement, compte tenu de leur spécificité. Une commission d'enquête a révélé le déficit attendu d'enseignants dans l'enseignement secondaire supérieur. La croissance attendue des groupes d'âge intéressés par l'enseignement primaire et secondaire et les projections d'effectifs disponibles (voir tableau ci-dessous) montrent l'effort qu'il sera encore nécessaire de faire afin de répondre aux besoins d'enseignant En effet, dans le même temps, il conviendra de poursuivre les efforts visant à diminuer le nombre d'élèves par maître et par classe et à alléger la tâche des enseignants. Or cette politique a également pour conséquence d'accroître les besoins en enseignants. Enfin, comme on a pu le souligner antérieurement la nécessité d'adapter la formation des enseignants au progrès des connaissances et aux nouvelles méthodes d'enseignement, devrait entraîner peu à peu une prolongation de la durée de la formation des diverses catégories d'enseignants, une telle mesure nécessitera également, dans la première phase de son application, de faire appel à toutes les ressources en personnel qualifié pour enseigner afin de compenser les effets, sur l'offre d'enseignants, de la prolongation de la formation.

TABLEAU 9

ACCROISSEMENT ATTENDU DES GROUPES D'AGE CORRESPONDANT A LA PERIODE D'ENSEIGNEMENT PRIMAIRE ET SECONDAIRE (1965-1985)

Années Groupes d'âge	1965	1970	1975	1980	1985
6 - 11	100	107	119	124	121
12 - 15	100	101	108	121	126
16 - 19	100	84	87	94	105

Source : Tableau IV (Annexe statistique)

TABLEAU 10
EVOLUTION ATTENDUE DES EFFECTIFS DE L'ENSEIGNEMENT PRIMAIRE ET SECONDAIRE (GENERAL) 1964-1975

Années Types d'enseignement	1964	1970	1975
Enseignement primaire	100	107	119
Enseignement secondaire (1er cycle)	100	110	120
Enseignement secondaire (2ème cycle)			
gymnase	100	149	181
écoles de commerce	100	98	111

ANNEXE I

BIBLIOGRAPHIE

Sommaire du document de synthèse intéressant les enseignants en Suisse

1. UNESCO : L'éducation dans le Monde tomes II, III et IV.
2. Centre International d'information et de recherche sur la formation professionnelle (CRIF - BIT - Genève, 1964) : la Formation des professeurs de l'enseignement professionnel.
3. Bureau International de l'Education - UNESCO : "La pénurie de personnel enseignant primaire" (publication n° 255).
4. "La pénurie de personnel enseignant secondaire" (publication n° 301).
5. "Le mouvement éducatif en 1961-1962, 1964, 1965, 1966, 1967" - Suisse - Rapport établi pour les Conférences Internationales de l'Instruction Publique.
6. Conseil de l'Europe : Guide des systèmes scolaires (1965 et la formation du personnel enseignant 1965).
7. Rapport de la Commission fédérale d'experts pour l'étude d'une aide aux universités - Berne : Département fédéral de l'intérieur (1964).
8. Rapport de la Commission fédérale pour l'étude des problèmes de relève dans le domaine des sciences morales, des professions médicales et des maîtres d'écoles moyennes - Berne : Département fédéral de l'intérieur (1963).
9. Dr. E. Egger : Faut-il former les instituteurs à l'université ? Repères n° 8 1965.
10. Le statut des professeurs de l'enseignement secondaire en Suisse. Le recrutement, la formation, le perfectionnement (article à paraître dans la revue française de pédagogie en 1968).
11. R. Dottrens : The training of teachers in Switzerland - The Yearbook of Education - 1963 (The Education and Training of Teachers).
12. P. Oguey : La pénurie de personnel enseignant dans l'enseignement primaire en Suisse. Archiv für das Schweizerische Unterrichtswesen - 42 Jahrgang 1956.

13. Der Mangel an Primarlehrer und die Getroffenen Gegenmassnahmen". Archiv für das Schweizerische Unterrichtswesen 47 Jahrgang 1961.

14. P. Wildman : Stand, Grundlagen der Planung und Voraussichtliche Betriebs und Investitionsaugaben 1965/1985, (à paraître en 1968).

15. Annuaires Statistiques de la Suisse : 1952 - 1957 - 1963

16. L'enseignement en Suisse : Notes et études documentaires n° 3.046 du 13 décembre 1963. La documentation française.

17. Documents divers élaborés par le "Centre d'information en matière d'enseignement et d'éducation" - Genève.

ANNEXE II : STATISTIQUES

L'annexe statistique comprend un nombre limité de tableaux, les statistiques d'enseignants n'étant pas développées au niveau fédéral. Aussi, les séries de chiffres données dans les tableaux suivants sont-elles parfois peu homogènes. Certains chiffres proviennent de source officielle (annuaire statistique de la Suisse) d'autres de documents ou études divers dont la liste est donnée dans l'Annexe I. Compte tenu de la faiblesse des données disponibles, aucun chiffre n'a été fourni en ce qui concerne l'enseignement technique et professionnel.

TABLEAU I

NOMBRE D'ENSEIGNANTS DES ETABLISSEMENTS PUBLICS (1) DE NIVEAU PRIMAIRE ET SECONDAIRE

	1951-1952				1956-1957				1961-1962				1970	1975
	Corps enseignant		Maitresses ménagères (2)	Instituteurs auxiliaires	Corps enseignant		Maitresses ménagères (2)	Instituteurs auxiliaires	Corps enseignant		Maitresses ménagères (2)	Instituteurs auxiliaires	Corps enseignant	Corps enseignant
	HF	F			HF	F			HF	F			HF	HF
Ecoles primaires	14.476	5.721	3.617	976	16.429	6.795	4.184	1.490	17.714	7.658	4.048	1.999	-	-
Ecoles secondaires	2.365	288	-	-	2.963	357	-	-	3.576	401	61	379	-	-
Ecoles moyennes inférieures (3)	945	113	-	-	1.102	137	-	-	767	117	-	417	-	-
Ecoles moyennes supérieures (4)	1.170	188	-	-	1.200	198	-	-	2.240	327	-	1.230	2.686 5)	3.266 5)
Ecoles de commerce du degré moyen et d'administration	340	46	-	158	469	97	-	127	393	75	-	188	863 5)	981 5)

Notes : (1) Depuis 1961/1962, y compris les collèges privés reconnus par la Confédération (écoles moyennes supérieures).

(2) Maîtresses ménagères : y compris le corps enseignant des écoles secondaires ; maîtresses d'ouvrage et maîtresses d'écoles ménagères en 1961/1962.

(3) Ecoles moyennes inférieures : enseignants comptés dans les écoles moyennes supérieures pour 9 cantons.

(4) Ecoles moyennes supérieures : y compris écoles de commerce dans 5 cantons en 1951/1952 ; dans 9 cantons en 1956/1957.

(5) Hypothèse d'évolution irrégulière du taux de scolarisation (variante III de l'étude citée dans la bibliographie n° 8).

Source : Bibliographie n° 15 sauf pour 1970/1975 : bibliographie n° 8.

TABLEAU II

NOUVEAUX ENTRANTS, EFFECTIF TOTAL ET DIPLOMES DES ECOLES NORMALES D'INSTITUTEURS - DIPLOMES DES ECOLES NORMALES POUR L'ENSEIGNEMENT SECONDAIRE DU 1ER CYCLE (1)

	1950		1955		1961	1965	1970	1975
	HF	F	HF	F	HF	HF	HF	HF
Ecoles normales d'instituteurs								
Nouveaux inscrits	$1053^{a)}$	$491^{a)}$	$1562^{a)}$	$741^{a)}$	-	-	-	$-^{5)}$
Effectif total	$-^{2)}$	-	$-^{2)}$	-	$6450^{b)3)}$	$1041^{c)4)}$	$11691^{b)5)}$	$14183^{b)}$
Diplômés	$798^{a)}$	$432^{a)}$	$1132^{a)}$	$585^{a)}$	$1359^{d)}$	$2021^{d)}$	-	-
Ecoles normales pour l'enseignement secondaire du 1er cycle								
Diplômés	-	-	$241^{d)}$	-	$315^{d)}$	$292^{d)}$	-	-

Source : a) Bibliographie n° 12
b) Bibliographie n° 8
c) Bibliographie n° 5
d) Bibliographie N° 17.

Notes : 1) Cycle supérieur de l'enseignement primaire, écoles secondaires.

2) L'enquête indiquée dans la bibliographie n° 8 donne des chiffres minorés toutes les écoles n'ayant pas répondu à l'enquête ; les données étaient les suivantes : 1950 : 2.685, 1955 : 3.082. En 1960, il apparaissait que les chiffres de l'enquête portaient sur environ 65 % de l'effectif total réel des normaliens.

3) 1960 ; en 1961 ce chiffre a été estimé à 6.900 dans l'enquête citée sous 2).

4) 1964/1965.

5) Voir note 5) sous tableau I.

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TABLEAU III

EFFECTIF D'ELEVES DES ETABLISSEMENTS PUBLICS DE NIVEAU PRIMAIRE (1) ET SECONDAIRE (NON COMPRIS L'ENSEIGNEMENT TECHNIQUE ET PROFESSIONNEL 1951-1975

	1951/52	1956/57	1961/62	1964/65	1970	1975
Ecoles primaires (chiffres rectifiés) (2)	-	445.317[a]	456.683[a]	468.664[b]	501.000[a]	558.000[a]
Ecoles primaires (Annuaire statistique de la Suisse)	476.331	557.406	577.055	-	-	-
Enseignement secondaire du 1er cycle (chiffres rectifiés) (2)	-	222.658[a]	228.143[a]	211.659[b]	232.000[a]	254.500[a]
Enseignement secondaire du 1er cycle (Annuaire statistique de la Suisse) Total	80.207	110.520	118.150			
dont écoles secondaires	56.166	77.316	88.540	-	-	-
écoles moyennes inférieures	24.041	33.204	29.610	-	-	-
écoles moyennes supérieures (4)	12.576	15.437	24.837	30.590[b]	45.513[c]	55.358[c]
Ecoles de commerce et d'administration (4)	7.222	7.682	9.516	11.500[b](3)	11.274[c]	12.810[c]

Source : Autre que l'annuaire statistique de la Suisse : 1952, 1957 et 1962).

(a) Bibliographie n° 14.

(b) Bibliographie n° 5.

(c) Bibliographie n° 8.

Notes :

(1) Y compris les classes spéciales

(2) La rectification des chiffres publiés par l'Annuaire Statistique de la Suisse a eu pour objectif de redistribuer des élèves entre l'enseignement primaire stricto sensu et l'enseignement du 1er cycle comprenant les sections supérieures de l'enseignement primaire, les écoles secondaires, les écoles moyennes inférieures ; cette redistribution des élèves entre ces 2 niveaux n'a pas été faite pour 1951/52.

(3) Chiffre approximatif se rapportant à l'année 1963/64.

(4) Pour les chiffres retenus pour 1970 et 1975 voir note 5, tableau I.

TABLEAU IV

EVOLUTION DE LA POPULATION D'AGE SCOLAIRE CORRESPONDANT A L'ENSEIGNEMENT PRIMAIRE ET SECONDAIRE (1950-1985)

Années Groupes d'âges	1950	1955	1960	1965	1970	1975	1980	1985
6 - 11	409.228	499.690	486.518	509.679	545.331	606.615	631.136	619018
12 - 15	249.228	271.993	339.365	335.331	338.221	362.575	406.565	421712
16 - 19	269.277	257.073	301.709	392.739	328.960	342.501	367.924	412008

Source : Bibliographie n° 14.

YUGOSLAVIA

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DIAGRAMME OF THE OLD AND THE NEW STRUCTURE
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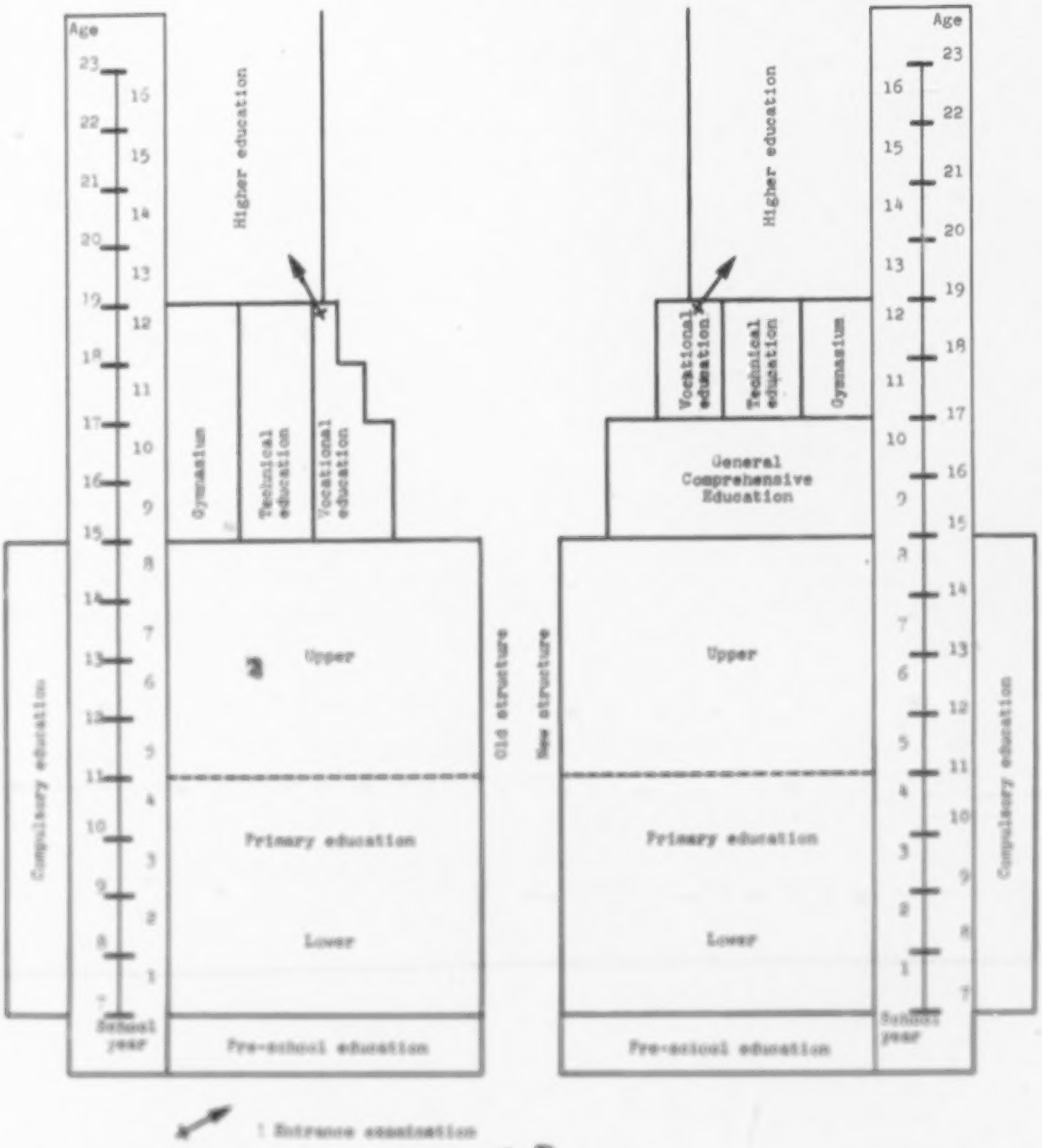
Age
School year
Higher education
Gymnasium
Technical education
Vocational education
General Comprehensive Education
Upper
Primary education
Lower
Pre-school education
Compulsory education
Old structure
New structure
1 Entrance examination

PREFACE

The programmes of the O.E.C.D. Committee for Scientific and Technical Personnel have given considerable attention to the problems connected with the demand for and supply of teachers as a vital element in the quantitative and qualitative development of the educational system. The quest for an equilibrium between supply and demand calls for the implementation of specific training, recruitment and utilisation policies in what is one of the most important sectors of highly qualified manpower.

Questions concerning the demand for and supply of teachers arose in several studies carried out by the O.E.C.D. particularly in connection with a) general studies on scientific and technical personnel in O.E.C.D. countries, b) general policy and planning in the field of education in Member countries, c) the recruitment and training of mathematics and science teachers.

In order to take stock of the current and future teacher situation in primary and secondary education, both from a quantitative and qualitative point of view, the Committee requested the Secretariat to prepare a general policy report on this question which would be based on the experience and data put together for a number of O.E.C.D. countries in the form of individual country case-studies.

The present report represents the Yugoslav contribution to the series of case-studies on the training, recruitment and utilisation of teachers in primary and secondary education. It has been prepared at the request of the Secretariat, by the Economic Institute of Zagreb in close collaboration with the Yugoslav Mediterranean Regional Project Bureau. The Federal Council for Education and Culture has approved the publication of the results of this study.

INTRODUCTORY REMARKS

The following study of the current situation, future requirements and potential supply of elementary and secondary school teachers in Yugoslavia has been made in co-operation with the Organisation for Economic Co-operation and Development (O.E.C.D.).

The study is designed to provide a detailed analysis of the teacher problem in elementary and secondary schools and, on the basis of existing situation, to explore the possibilities of teacher supply in the period 1964/65 - 1974/75, with a view to removing existing disproportions and improving educational standards.

The study pays more attention to some aspects of the problem than is usually done: this has been necessitated by the broad scope of the problem and by the uses for which the study is intended. This is particularly true of those parts of the study which are meant to provide a basis for international comparisons of the systems of teacher training and of the teacher's social status.

The quantitative analysis of the present teacher situation in elementary and secondary schools is based on the Teacher Census made on 30th November 1962(1) and on computations of these figures at the Electronic Centre in Belgrade.

The projection of teacher requirements for Yugoslav elementary and secondary schools in the coming period is based on the expected trends in enrolments(1), on school curricula(2), and on optimum educational standards(3).

---

(1) Statistical Bulletins, Nos. 313, 336, 343, 356 (Federal Institute for Statistics).

The entire planned period covered by this study has been divided into two sub-periods of five years each: the objective in the first (until 1969-70) is to gradually replace or re-train those teachers that are not qualified for the subjects they currently teach; the sole objective in the second sub-period (until 1974-75) is to improve the quality of teaching and normative ratios.

---

(1) The expected trends in elementary and secondary enrolments are outlined in the study "The Development of Education in the period 1966-1970 and its Adaptation to Economic and Social Needs" and in the paper entitled "Quantitative Educational Projections for Yugoslavia in the Period 1970-71 - 1974-75". The same method (described in detail in Appendix A of the first of these studies) has been used in both cases to project educational enrolments in elementary and secondary schools.

(2) The curricula of schools in the Republics of Serbia, Croatia and Slovenia have been used as representative of the whole of Yugoslavia.

(3) The educational standards applied in this study have been elaborated by the Educational Standards Service of the Institute for the Promotion of Technical and Vocational Education of Croatia.

1. PRESENT-DAY TEACHER SITUATION AND TEACHER NEEDS IN THE COMING PERIOD

1.1. Teacher Profiles

The characteristic features of development of elementary and secondary education in Yugoslavia in recent years have been increased enrolments in eight-year elementary schools, a steady increase in the number of those elementary-school graduates who proceed to a higher level, and the consequent expansion of secondary education. In 1965, 92 per cent of young people in the age group 7-14, and 32.3 per cent of those in the age group 15-18, were enrolled in elementary and secondary schools.

It is understandable that such developments should lead to the problem of teacher supply as one of the basic preconditions for the normal functioning of schools and for the implementation of the syllabus and curricula. Not only are more teachers needed in this situation: they should also be professionally better prepared for their tasks.

The profiles of teachers now teaching in Yugoslav schools are varied. In elementary schools we find combined-subject teachers (from first to fourth, or even fifth form), single-subject teachers and special-subject teachers (from fifth to eighth form) and specialists in education or psychologists.

Combined-subject teachers are trained at secondary and post-secondary levels; single-subject teachers at post-secondary and college and university levels; special-subject teachers (for technical and musical education, physical training, and fine arts) at secondary, post-secondary, college and university levels; specialists in education and psychologists at college and university levels(1).

---

(1) This analysis of the profiles of elementary school teachers was made at the Yugoslav Institute for Educational Research, Belgrade, 1964. Until 1960-61 combined-subject teachers used to be secondary teacher training school graduates; now they are increasingly the graduates of two-year post-secondary teacher training schools (Pedagogic Academies). Although the quality of single-subject teaching in elementary schools would be improved by having college and university graduates as teachers, this is not a requirement as it is not feasible at this stage, in view of the material and personnel resources available. Thus, college and university training - though not compulsory for elementary school teachers - is acceptable.

In secondary schools one meets mainly three types of teachers: the first type for general subjects, natural sciences, and mathematics; the second type for theoretical-technical specialist subjects; and the third type for practical-technical (vocational) specialist subjects. The first type is found in Gymnasia and technical schools, and the second and third type only in technical and vocational schools, exclusive of teacher training schools(1).

Teachers in Gymnasia are required to possess graduate degrees from universities, colleges or arts academies. Teachers of physical training, technical education and pre-military training, as well as those for extra-curricular activities, may also be graduates of technical or vocational schools or those that have obtained teaching qualifications in other ways. Since physical training, technical education and pre-military training account for only 14 per cent of the teaching-time in Gymnasia, it follows that 86 per cent of teachers in Gymnasia should possess university qualifications, obtained mainly at faculties of arts and letters and natural sciences and mathematics.

In technical schools, general and technical subjects should be taught by teachers with corresponding university or college backgrounds. If teachers with lower qualifications are still found in some cases, this is only a temporary solution, Only for practical skill training, in workshops and laboratories, can teachers with secondary or post-secondary qualifications be employed. This also applies to subjects such as physical training and pre-military training.

In schools for skilled workers, general, socio-economic and natural science subjects and mathematics are taught by graduate teachers from appropriate faculties or colleges or by two-year post-secondary teacher training school graduates. There has been a tendency to employ primarily university and college graduates for these subjects.

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(1) The list of secondary schools includes, in addition to Gymnasia, also technical and similar schools, schools for skilled workers teacher training schools, and arts schools.

Technical and specialist training is also conducted by teachers with appropriate university, college and post-secondary school qualifications, but there are also cases in some schools of teachers with secondary qualifications.

Practical skill training is conducted by workshop teachers and trainers with varying educational backgrounds. They are usually highly skilled workers in appropriate occupations and trades, but there is also a growing number of teachers that have graduated the vocational teacher training school.

Requirements for teachers in secondary teacher training schools are the same as for teachers in Gymnasia.

In arts schools (secondary schools of music, ballet and applied art) general subjects are taught by university graduates, while special subjects are taught by those that have graduated the academy of music or fine arts.

1.2. Present-Day Teacher Situation

The present situation with respect to teachers is burdened by two major problems:

- a shortage of teachers, especially for certain subjects of instruction;
- an inadequate qualification structure of the teaching personnel.

Although the shortage of full-time teachers is nowhere explicitly stated, it can be noticed in some of the statistics, notably in the average number of full-time teachers per class, the average number of pupils per teacher, and the number of periods taught overtime or part-time.

The figures show that the situation is worse in elementary schools and schools for skilled workers. The shortage of trained teachers has so far been a chronic source of weakness in these schools and has had an adverse effect on the amount and quality of the pupils' knowledge.

Attempts to alleviate the difficulties that this situation causes in teaching are seen in the figures relating to part-time teaching. Although part-time teaching does not necessarily

Table 1: Number of full-time teachers, classes and pupils in 1964-65

Type of school	Number of Pupils	Number of classes	Number of teachers	Average number of teachers per class	Average number of pupils per teacher
Elementary schools-total	2,999,586	92,076	96,827	1.05	31.0
Gymnasia	168,727	5,079	6,842	1.35	24.7
Technical and other schools for the economy and public services	197,136	6,165	6,635	1.07	29.7
Teacher training schools	29,042	900	1,309	1.45	22.2
Arts schools	5,534	83	771	....	7.18
Schools for skilled workers	166,267	5,766	3,444	0.60	48.40
GRAND TOTAL(1)	3,560,758	109,986	115,057	1.05	31.0

Source: Statistical Bulletin No. 355 (Federal Institute for Statistics) and "Elementary and Secondary Schools at the Beginning of 1964-65".

appear as a negative indicator of the state of affairs in the teaching process, it is a significant pointer to the need for more teachers in some types of schools and for some subjects. This is particularly true of elementary schools, while in the schools teaching production skills (technical and vocational schools, for instance) the situation is not so critical. In the latter types of schools it is actually desirable that teachers of vocational subjects and skills should be people who are at least partly involved in production itself.

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(1) Arts schools are not included here, as the number of teachers per class could not be shown.

Although the indicators illustrating this point are based on 1962-63 data (that is, those obtained by the 1962 Teacher Census), it may be assumed that the situation had not materially changed by the academic year 1964-65.

The following table shows what percentage of the total number of teaching hours was covered by part-time and overtime teaching. The table includes those subjects of instruction (by types of school) for which teachers are trained at two-year post-secondary schools and teacher-training colleges and faculties: see Table 2.

The percentages of teaching hours covered by part-time and overtime teaching shown in the column "Total" refer not only to the 17 subjects listed in the table but also to technical - especially theoretical - subjects and practical work in vocational schools, not given separately in the table.

The highest percentage of part-time teaching was done in higher forms of elementary schools, which means that the availability of qualified teachers at this level is lowest. It is also noteworthy that the highest percentage of part-time teaching in all schools taken together was needed for natural science and mathematics group of subjects (especially mathematics and physics), for foreign languages (notably Russian), and for physical training. These figures are a clear indication of the shortage of teachers for these subjects.

The assessment of the qualification level of the teaching staff in a given type of school is based on the number of teachers not qualified to teach the subject they actually teach and on the type of school graduated by the teacher himself. A more realistic picture would be obtained if we also had the data concerning the teachers' speciality and related these to the subjects they teach. Unfortunately, such data are lacking. It may therefore be assumed that the actual teacher qualification structure is far graver than shown in the table that follows, even though this one is grave enough to cause concern. In all types of schools taken together, more than one fifth of all

Table 2: Percentage of teaching hours covered by part-time and overtime teaching, by subjects and types of school, in 1962-63

Subject of instruction	Elementary schools	Gymnasia	Technical schools	Agricultural Veterinary schools	Economic Administrative and Secretarial schools	Medical schools	Teacher training	Arts schools	Schools for skilled workers
Combined subject teaching	19.8	-	-	-	-	-	-	-	-
Mother tongue	30.2	17.4	19.8	18.3	19.0	15.9	22.4	9.7	18.1
Foreign language	37.2	23.5	24.8	19.3	25.8	21.0	29.3	16.2	-
(a) Russian	41.2	25.8	...	12.9	32.7	17.3	32.9	30.0	-
(b) English	30.6	23.4	...	25.6	28.8	18.7	17.3	17.3	-
(c) French	37.2	22.8	...	16.7	20.1	25.4	26.1	13.9	-
(d) German	37.5	24.6	...	16.8	28.1	23.1	15.5	8.7	-
Mathematics	37.0	29.4	29.1	28.6	30.0	11.1	30.1	10.3	22.0
Physics	39.5	27.7	29.0	29.5	-	20.4	28.1	0.0	28.4
Chemistry	33.7	19.7	23.4	18.9	-	14.9	21.2	0.0	14.7
History	28.2	16.4	18.4	7.5	19.3	19.3	18.5	1.4	19.6
Geography	25.3	17.6	22.1	14.0	21.3	10.0	16.9	10.5	-
Biology	32.2	15.0	-	11.1	-	16.1	19.9	-	-
Arts	27.7	17.4	-	-	-	-	14.5	-	-
Technical education	19.6	12.7	-	-	-	-	25.5	-	-
Physical training	19.0	19.8	27.5	30.0	27.3	37.8	28.0	55.5	32.2
Musical education	24.2	8.4	-	-	-	-	53.5	-	-
Home economics	22.7	-	-	-	-	-	-	-	-
Classical languages	-	21.4	-	-	-	46.8	-	-	-
Philosophy, logic, psychology	-	23.5	-	-	-	-	26.3	-	-
Pedagogic sciences	-	-	-	-	-	-	24.3	-	-
TOTAL	24.1	21.4	28.8	24.1	23.3	37.6	22.6	32.5	20.3

Source: 1962 Teacher Census

teachers are unqualified to teach the subjects they actually teach(1).

The situation is quite serious also with single-subject teaching in elementary schools, while the qualification picture in vocational and technical schools is worse than in Gymnasia and secondary teacher training schools.

It is interesting to note that 1962 Teacher Census data indicate 57 different types of educational background for teachers -ranging from four years of primary education to over 20 different faculties.

Out of the total number of teachers employed in elementary schools in 1962-63, 87.7 per cent possessed formal teaching qualifications, while the remaining 12.3 per cent were not formally qualified to teach.

However, the actual number of inadequately qualified teachers in schools was much higher if one considers the structure of teachers by level of educational background.

Owing to the shortage of trained teachers, many persons appointed to teach lacked even the minimum qualifications, as seen from the following table:

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(1) By "not qualified to teach the subjects they actually teach" we mean the professional qualification, not school background. The latter is not always identical with the former. Thus, for instance, a teacher who has graduated history at a post-secondary teacher training school or at a faculty of arts and letters cannot be regarded as qualified to teach "Mother Tongue", even though his educational level is high enough.

Table 3: Structure of elementary and secondary school teachers by educational background in 1962

percentages

Teachers' educational background	elementary school	secondary school
Elementary school	2.5	1.0
School for skilled and highly skilled workers	0.4	5.5
Technical or similar school	1.8	10.7
Teacher training or arts school	64.8	9.9
Gymnasium	6.9	4.0
Two-year post-secondary school	17.6	13.7
College	0.2	1.7
Faculty or arts academy	5.8	53.5
Total	100.0	100.0

The figures given here show that 88.4 per cent of elementary school teachers were graduates of teacher training schools, two-year post-secondary schools, colleges or faculties, while 11.6 per cent had other educational backgrounds. The problem of skilled teachers at this level does not arise in connection with combined-subject teaching (where 96 per cent of teachers have the required secondary teacher training school qualification) but rather in connection with single-subject teaching.

Single subjects are still taught by a considerable number of teachers without required qualifications. Thus, one often finds primary school teachers -especially in village schools - teaching separate subjects.

Figures for secondary school teachers show that some 30 per cent of them have secondary school backgrounds, 14 per cent have two-year post-secondary education, and 55 per cent are college or university graduates. However, the problem at this level is not only that of the adequate educational background but also that of the speciality.

By filling teacher vacancies with inadequately trained people (particularly in village schools) one can only meet the demands of the moment. The influx of growing numbers of trained teachers, coupled with efforts at upgrading the skills of those currently employed as teachers and with the ban on future employment of unqualified teachers, will certainly result in an improved qualification structure of teachers. Some Republics have already introduced compulsory supplementary training schemes, free of charge, for inadequately trained teachers. Participants at such courses are given a paid leave of absence while attending them and are also encouraged to attend various seminars during summer and winter vacations, etc. The training of such people is organised also in part-time and correspondence training centres and in institutions of higher learning.

On the basis of 1962 Teacher Census figures, an estimate of the teacher qualification structure in 1964-65 has been made. The estimated situation was as follows:

Table 4: Estimated numbers of teachers employed in 1964/65 and their qualifications(1)

Type of school	Estimated number of teachers in 1964/65	Number of those untrained in the subject they teach	%
Elementary schools			
(a) combined subject teaching	49,207	1,230	2.5
(b) single subject teaching	47,620	19,640	41.2
Total	96,827	20,870	21.6
Gymnasia	6,842	1,530	22.4
Teacher training schools	1,309	394	30.0
Arts schools	771	...	....
Technical and other schools for the economy and public services (exclusive of economic, administrative and secretarial schools(2)	4,427	1,879	42.4
Schools for skilled workers	3,444	2,425	70.4
Total (exclusive of arts schools)	112,849	27,163	24.1

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(1) There are no accurate data concerning the professional specialisation of teachers but only concerning their educational backgrounds. That is why an estimate of the number and qualification of teachers employed in 1964-65 has had to be made on the basis of 1962 Teacher Census data. The estimates given here refer also to their professional qualifications and not only to their educational backgrounds.

(2) Available statistics for economic, administrative and secretarial schools were not reliable enough to serve as a basis for an assessment of the teacher qualification structure in 1964-65.

1.2.1. Capacities of teacher-training institutions

The training of teachers in Yugoslavia is done in 165 institutions: most of them are secondary institutions (58.2 per cent), while others are post-secondary (23.6 per cent) and university and college establishments (18.2 per cent).

These institutions are of twenty different types.

Table 5: Development of teacher-training institutions

Type of institution	Number of institutions			Index 66/56 = 100
	55/56	60/61	65/66	
Secondary teacher-training schools	115	110	96	83.5
Post-secondary teacher-training schools	17	20	39	129.4
University faculties, arts academies and colleges for teacher training	15	24	30	100.0
Total:	147	154	165	112.2

Source: Statistical Bulletins: Elementary and Secondary Schools; Higher Institutions for Teacher Training.

As seen from this table, the development of teacher-training institutions in the last ten years has been characterised by two trends: the quantitative growth of such institutions and the qualitative improvement of their structure.

The quantitative growth is seen in the fact that eighteen new institutions have been established (there were 147 of them in 1955-56 and 165 in 1965/66), which is an increase of 12.2 per cent.

The qualitative improvement of the structure of teacher-training institutions has been achieved by -

- reducing the number of secondary teacher-training institutions by 19 schools or 16.5 per cent (from 115 in 1955-56 to 96 in 1965-66);

- increasing the number of post-secondary schools by 22 or 129.4 per cent in the same period;
- increasing the number of university faculties and colleges that prepare secondary and elementary school teachers: the number of such institutions has doubled (from 15 to 30) in the past period.

The positive process of development of the network of elementary-school teacher-training institutions has been greatly intensified since 1960-61 and will continue until all secondary schools for the training of elementary-school teachers are replaced by higher education institutions capable of producing the required numbers of teachers for elementary schools.

The increase in the number of teacher-training institutions has been paralleled by the expansion of their capacity. This is reflected in the increased total number of pupils and students in different academic years of the period under review, as well as in the number of first-year enrolments in secondary teacher-training institutions and higher education institutions.

The index of total enrolments in 1965-66, compared with the year 1955-56, was 144.4. The corresponding index of first-year enrolments was 178.3.

Table 6: Index of increase in total and first year enrolments by type of institution $\frac{1965\text{-}66}{1955\text{-}56}$

Type of institution	Total enrolments	First-year enrolments
Secondary teacher-training schools	129.9	152.7
Post-secondary teacher-training schools	287.8	233.5
University faculties, arts academies and colleges for teacher training	125.0	177.1

These figures illustrate a significant growth in enrolments in post-secondary teacher-training institutions, teacher-training faculties, colleges and arts academies, which is in accord with the expansion of the network of these institutions. However, enrolments in secondary teacher-training schools have also gone up, even though the number of such schools has been reduced appreciably. The said increase in secondary teacher-training school enrolments refers mainly to the period 1955-56 - 1960-61. After this period the total enrolments in such schools have risen only slightly, while first-year enrolments have tended to remain the same. The increase in this category has been confined to primary teacher-training schools and to schools of physical training; in other schools there has been a slight reduction in enrolments.

The structure of pupils and students in teacher-training institutions corresponds to the capacities of training institutions.

Although the structure has improved in favour of post-secondary, university and college institutions, the ratio between those preparing for the teaching profession at higher education level and at secondary education level is still unfavourable if seen from the point of view of school needs. (Thus, in 1965-66 there were 34,465 students at teacher training faculties, colleges, arts academies and post-secondary teacher-training schools.)

The ratic is even less favourable if one considers the fact that not all graduates from teacher-training colleges, faculties and arts academies enter the teaching profession(1). Besides, they do not turn out elementary school teachers in the first place but rather secondary school teachers.

1.3. The forecast of teacher needs in elementary and secondary schools in the period 1964-65 - 1974-75

The growing needs for teachers in each year of the planned period will be determined by the planned increase in elementary school enrolments, by the higher percentage of elementary school graduates proceeding to secondary education, and by an attempt to make good the deficit of teachers inherited from earlier periods. An exception to this general upward trend is only expected in secondary teacher-training schools which will gradually close in all Republics. It is planned that the teacher deficit will be balanced by 1969-70. The plan also provides for the loss of teachers due to natural causes (retirement - 2 per cent; death - 1 per cent) which also have to be replaced by newly trained teachers.

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(1) Graduates from teacher-training faculties and institutions of higher learning, apart from becoming teachers, also seek appointments in various cultural and social institutions, in top business positions, and in research establishments and scientific institutions.

Table 7: The forecast of the number of full-time teachers and its relation to the number of classes and number of pupils in the last year of the planned period

Type of school	Number of pupils	Number of classes	Number of full-time teachers	Average number of teachers per class	Average number of pupils per teacher
Elementary schools total					
1969-70	3,090,732	89,763	108,994	1.21	28.36
1974-75	3,274,846	94,612	108,065	1.14	30.30
(a) combined-subject teaching					
1969-70	1,854,100	54,431	54,431	1.00	34.06
1974-75	1,852,372	53,970	53,970	1.00	34.32
(b) single-subject teaching					
1969-70	1,236,632	35,332	54,563	1.54	22.66
1974-75	1,422,474	40,642	54,093	1.33	26,30
Gymnasia					
1969-70	198,636	6,621	9,271	1.40	21.43
1974-75	204,125	6,804	9,523	1.40	21.43
Technical and similar schools					
1969-70	266,551	8,622	12,689	1.47	21.01
1974-75	383,051	12,768	18,708	1.47	20.48
Teacher training schools					
1969-70	21,550	718	1,091	1.52	19.75
1974-75	22,414	747	1,134	1.52	19.75
Arts schools					
1969-70	6,375	112	1,092	2.13	5.84
1974-75	8,572	152	1,472	2.13	5.82
Schools for skilled workers					
1969-70	223,642	7,454	10,144	1.36	22.05
1974-75	276,717	9,224	12,555	1.36	22.04
GRAND TOTAL					
1969-70	3,807,486	113,290	143,281	1.26	26.57
1974-75	4,169,725	124,307	151,457	1.22	27.53

Data on the planned number of subject-teachers in elementary schools rest on the assumption that the weekly teaching load per teacher will gradually go up to reach 22 hours in 1974-75. This explains the difference in the average number of teachers per class and the average number of pupils per teacher as between 1969-70 and 1974-75. The forecasts of the number of teachers needed in 1969-70 are based on the assumption that the weekly teaching load in that year will be 18.9 hours (or periods), which will rise to 22 hours in 1974-75. If these figures are compared with those for the year 1964-65 (see above), we note that the teacher deficit in that year was considerable.

Table 8: Estimated number of new teachers needed in the planned period 1965-66 - 1974-75

Type of school	Number of new full-time teachers required					
	1965-66 - 1969-70			1970-71 - 1974-75		
	Total	Teachers needed because of increased enrolments	Teachers needed for replacements	Total	Teachers needed because of increased enrolments	Teachers needed for replacements
Elementary schools	36,186	27,421	8,765	24,098	15,333	8,765
(a) combined-subject teaching	13,431	12,916	515	8,176	7,661	515
(b) single-subject teaching	22,755	14,505	8,250	15,922	7,672	8,250
Gymnasia	4,305	3,645	660	2,275	1,615	660
Teacher training schools	277	112	165	385	220	165
Arts schools	469	449	20	590	561	29
Technical and similar schools	7,063	6,758	305	9,053	8,292	801
Schools for skilled workers	7,954	6,300	1,654	5,944	4,290	1,654
GRAND TOTAL	56,254	44,685	11,569	42,345	30,311	12,074

This review of the total number of new teachers needed comprises the needs arising out of increased enrolments and out of the necessity to replace unqualified teachers and those lost through the operation of natural causes. Inadequately qualified teachers are to be gradually replaced through all the years of the planned period, so that they should be completely eliminated by the year 1974-75.

The distribution of new teachers according to the level of educational background required for elementary and secondary school teaching in the planned period is shown in the following table: see Table 9.

The needs envisaged by this forecast are to be satisfied by the influx of graduates from faculties of arts and letters, natural sciences and mathematics, and other faculties and colleges, as well as from two-year post-secondary teacher training schools (Pedagogic Academies) and to a certain extent from secondary teacher-training and other schools.

The needs for teachers with secondary school qualifications are diminishing, and in the second half of the planned period they will only appear in vocational and similar schools in the case of practical skill teachers and trainers in workshops. Following the provisions of the elementary education system, elementary schools will require mainly the graduates of two-year post-secondary teacher training schools. The operation of natural factors, on the other hand, such as retirement or death, will also bring about changes in the teacher qualification structure in favour of higher school backgrounds.

In order to make it possible for teacher training institutions to meet all needs with their available training capacities, a survey has been prepared of teacher supply and demand in the two parts of the planned period. Included in this survey are only those institutions whose basic task is the training of teachers, such as faculties of arts and letters, faculties of natural sciences and mathematics, colleges of physical training, two-year post-secondary teacher-training schools. (Pedagogic Academies), and secondary teacher-training schools.

Table 9: Estimated number of new teachers needed in elementary and secondary schools, by their educational background

Type of school	Number of new teachers required in the period							
	1965-1966 - 1969-70				1970-71 - 1974-75			
	Total	with univ. and college background	with two-year post-sec. school background	with secondary school background	Total	with univ. and college background	with two-year post-sec. school background	with secondary school background
Elementary schools Total	36,186		24,418	11,868	24,098	-	24,098	-
(a) combined-subject teaching	13,431		1,563	11,868	8,176	-	8,176	-
(b) single-subject teaching	22,755		22,755	-	15,922	-	15,922	-
Gymnasia	4,305	4,305	-	-	2,275	2,275	-	-
Teacher training schools	277	277	-	-	385	385	-	-
Arts schools	469	469	-	-	590	590	-	-
Technical and other schools for the economy and public services	7,063	6,661	201	201	9,053	8,431	311	311
Schools for skilled workers	7,954	4,839	2,379	736	5,944	3,755	1,624	565
GRAND TOTAL	56,254	16,551	26,898	12,805	42,345	15,436	26,033	876

These institutions prepare teachers of language and literature, social and natural science subjects, technical education, physical training, and musical education; they also prepare combined-subject teachers for primary schools.

Table 10: Needs for general subject teachers and the possibilities of meeting them in the first planned period 1965-66 - 1969-70

Type of teacher training institution	Estimated number of new teachers required(1)			Total number of graduates	Graduates intended to meet elementary and secondary school needs		Remainder	
	Elementary schools		Secondary school		number	percentage of all graduates	number	percentage of all graduates
	Combined subject teaching	Single subject teaching						
Secondary teacher training schools	11,868	-	-	22,901	11,868	51.8	11,033	48.2
Two-year post-secondary teacher training schools	1,563	22,755	-	27,020	24,318	90.0	2,702	10.0
Faculty of arts and letters	-	-	3,648	9,997	3,648	36.5	6,349	63.5
Faculty of natural sciences and mathematics	-	-	4,160	5,153	4,160	80.7	993	19.3
TOTAL	13,431	22,755	7,808	65,071	43,984	67.0	21,077	32.4

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(1) Included here are the teachers needed to replace inadequately trained teachers now employed.

Table 11: Needs for general subject teachers and the possibilities of meeting them in the second planned period 1970-71 - 1974-75

Type of teacher training institution	Estimated number of new teachers required(x)			Total number of graduates	Graduates intended to meet elementary and secondary school needs		Remainder	
	Elementary schools		Secondary school		number	percentage of all graduates	number	percentage of all graduates
	Combined subject teaching	Single subject teaching						
Two-year post-secondary teacher training schools	8,176	15,922	-	47,775	24,098	50.4	23,677	49.6
Faculty of arts and letters	-	-	4,170	14,400	4,170	28.9	10.230	71.1
Faculty of natural sciences and mathematics	-	-	3,768	10,710	3,768	35.2	6,942	64.8
TOTAL	8,176	15,922	7,938	72,885	32,036	34.9	40,849	56.0

From the two tables given above it follows that the total needs for new teachers will be greater in the first planned period than in the second. This is due to the decision to make good the deficit inherited from the past by 1969-70, which is quite feasible in view of the expected inflow of graduates from teacher-training institutions.

Elementary schools are expected to absorb a certain number of secondary teacher-training school graduates during the first planned period, because two-year post-secondary teacher training schools (Pedagogic Academies) will not be able, at first, to supply enough teachers for combined-subject and single-subject teaching. It is expected also that some of the graduates of faculties of arts and letters and natural sciences and mathematics will continue to find employment in elementary schools, as they have done in the past. For all these reasons, more and more two-year post-secondary teacher training school graduates will replace the graduates of secondary teacher-training schools as combined-subject teachers in primary schools. This is an unmistakably positive process which will mean a great deal for the chief educational tenets of the new elementary school. The possibilities of employment of secondary teacher-training school graduates in elementary schools will become rather limited.

Furthermore, the above tables indicate that secondary schools will, in the first period, be able to absorb 36.5 per cent of all graduates from faculties of arts and letters and as much as 80.7 per cent of natural science and mathematics graduates. (The latter figure is so high because of the acute deficit of teachers for natural science subjects and mathematics.)

It can be seen also that the needs in the second period are considerably smaller. This is due to the fact that the entire deficit will be balanced in the first period, while in the second period new teachers will only be needed to cope with increased enrolments and to replace those teachers that will be lost through natural causes in this period.

According to this forecast, the graduates of two-year post-secondary teacher training schools (Pedagogic Academies) will completely satisfy the needs of elementary schools in the second period - not only for single-subject but also for combined-subject teaching. An analysis has shown that - unless the capacities of the teacher training schools are adjusted to real needs - there may even appear a surplus of 23,677 teachers, or 49.6 per cent of all graduates from such schools.

The two-year post-secondary teacher training schools (Pedagogic Academies) represent a new type of schools in the Yugoslav educational system, which makes it difficult at this point to predict with any degree of certainty what percentage of their graduates will actually enter the teaching profession and how many will proceed to further university studies or enter other occupations. It is highly important, therefore, to follow up the movement of this category of people, so that appropriate measures could be taken in time.

Besides, measures will have to be taken to ensure more radical changes in the structure of secondary school enrolment and impose certain limitations on enrolment in secondary teacher-training schools. Such measures are justified also by the fact that the number of elementary school graduates prodeeding to secondary education is steadily rising. In the absence of any, or at least sufficiently quick, change in the structure of secondary school enrolments, the number of pupils in secondary teacher-training schools has been growing in absolute terms. It is expected that some of the graduates from such schools will continue their education at teacher-training institutions at higher levels, while others will seek employment in pre-school institutions.

In the second planned period, secondary schools are expected to absorb 28.9 per cent of all graduates from faculties of arts and letters and 35.2 per cent of those from natural science and mathematics faculties. However, no absolute surplus of such people is expected, since they can find employment outside educational institutions (in scientific research institutions, on radio and television, in newspapers, and in some other sectors of activity). The needs for such personnel, particularly natural science and mathematics graduates, will increase as research activities, adult education, cultural activities, and living standards generally, expand. In the Republic of Croatia, for instance, some 56.3 per cent of arts and letters graduates and 57.7 per cent of natural science and mathematics graduates have sought employment in the past outside educational institutions(1).

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(1) According to the data supplied by the Secretariat for Education of Croatia.

Table 12: **Full-time teachers in the field of technical and specialist training by types of school(1): situation in 1964-65 and forecast for 1974-75**

Type of school	Situation in 1964/65			Forecast for 1974/75		Index of increase of full-time teachers (6 : 2)	Estimated number of new teachers(5) entering the teaching profession during the 10 years
	Total full-time teachers	Number of unqualified teachers	%	Total number of teachers	Number of full-time teachers		
1	2	3	4	5	6	7	8
Technical school total	744	417	56.0	4,765	4,106	551	4,013
- mechanical eng.	-	-	-	1,626	1,382	-	-
- electrical eng.	-	-	-	751	638	-	-
- civil eng.	-	-	-	746	694	-	-
- processing	-	-	-	317	269	-	-
- Others	-	-	-	1,329	1,130	-	-
Agricultural, forestry, veterinary(2)	51	25	49.0	417	417	817	458
Economic, administrative(3)	1,221			2,700	2,565	210	1,868
Medical	320	281	87.8	1,299	649	202	698
Schools of applied art	70	24	34.2	157	157	224	140
Ballet(4)	69	-	-	160	160	231	136
Music	517	-	-	989	989	191	688
Schools for skilled workers	1,668	1,151	69.0	5,035	4,521	271	5,404
- metalworking	-	-	-	2,136	2,029	-	-
- electrical	-	-	-	886	842	-	-
- woodworking	-	-	-	201	201	-	-
- textile	-	-	-	586	469	-	-
Others	-	-	-	1,226	981	-	-
Total	4,660	1,898	40.7	15,522	13,564	291	13,405

(1) Teachers in technical schools and schools for skilled workers cannot be subdivided for lack of data.

(2) 1964/65 data on theoretical subject teachers in forestry schools are lacking and the index is consequently affected.

(3) The number of unskilled teachers in these schools is unknown.

(4) All teachers in these schools are included, because they are professionally trained. Pupils attend such schools parallel with some other kind of school.

(5) The needs for new teachers are caused by increased enrolments and number of classes, as well as by the necessity of replacing teachers lost through natural causes and of replacing unqualified by qualified teachers.

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It is interesting to observe the situation with respect to teachers for technical and specialist training. This training plays a very important part in the teaching process in most secondary technical and vocational schools. Available data indicate that teaching in this sphere is by and large done by part-time teachers. Unlike the situation in some other subjects, this situation has no adverse effect on the teaching process as long as the teaching load is reasonable. The reason for this is that the field of technical and specialist training contains subjects whose purpose is to guide the pupil in the acquisition of skills and to fuse the production process and the learning process into one. Therefore, the part-time teacher in this case is as a rule not a staff member of another school but rather of the business organisation for which the school is preparing personnel.

Since detailed data by sub-types of technical schools and schools for skilled workers are not available, nothing can be said about the qualification level of the teaching staff nor about the increase in the number of teachers by the end of the planned period.

We are unable, for the same reason, to state the number of new teachers needed in each sub-type of these schools during the coming ten-year period.

However, this review does contain some elements relating to full-time teachers in the technical and specialist training field. One notes that there are many teachers in technical and vocational schools unqualified to teach the subject they actually teach. The phenomen has assumed massive proportions in some types of schools: thus, in medical schools 87.8 per cent of teachers fall into this category, and in schools for skilled workers 69.0 per cent(1).

(1) These figures refer to full-time teachers in such schools. In medical schools, for instance, they are usually nurses, while doctors are employed exclusively for part-time teaching. A greater part of the teaching in secondary medical schools is part-time.

Besides, it is noteworthy that the index of increase in the number of full-time teachers is rather high in this field. This is understandable in view of the fact that there is an acute shortage of technical and vocational subject teachers in such schools. Current educational forecasts envisage an increase in the number of elementary school graduates proceeding to secondary education, mostly to vocational and technical schools. This will naturally require more teachers in the different types of secondary technical schools.

The estimates of the number of teachers needed for such schools rest on the assumption that a certain percentage of part-time teachers will remain in the technical and specialist training field. This percentage will depend on the type of school in question. They are needed to establish a link between teaching and practical work in the process of preparing pupils for occupations in certain branches of industry or service activities.

The increase in the total number of teachers at the end of the planned period is not very high: the index of increase is 125 in relation to the year 1964-65. The corresponding index of enrolment in elementary and secondary schools will be 116.95. Comparative indices for the two levels of education will be the following:

School	Index of increase 1974-75 / 1964-65	
	enrolments	teachers
Elementary	109.1	111.6
Secondary	157.9	198.4

The forecast of teacher needs and all outlines of future developments presented above are based on the assumption that the weekly teaching load will be 22 hours.

In order to achieve this, it will be necessary to introduce a series of measures designed to eliminate small and unviable schools, strengthen central schools, organise transport of pupils to more distant schools, rationalise the entire teaching process, etc. The implementation of these and similar measures will bring into the open certain financial reserves that can then be used to finance the proposed improvements in education and to provide incentives for teachers to pay more attention to the quality of their work.

2. WAYS AND MEANS OF TEACHER TRAINING

2.1. Training of teachers for elementary schools

The training of elementary school teachers is conducted at:

(a) institutions whose sole task it is to prepare teachers for elementary schools (such as secondary and two-year post-secondary teacher training schools);

(b) institutions that have some other specific tasks in addition to this one (such as secondary schools of physical training, secondary schools of music, schools of applied art, post-secondary teacher training schools of home economics, vocational teacher training colleges, colleges of physical training, faculties of arts and letters and natural sciences and mathematics, and arts academies).

Secondary teacher training schools

Those enrolling in secondary teacher training schools must be elementary school graduates and satisfy certain other requirements (have good hearing, for instance).

Only full-time pupils are admitted and the schooling lasts five years in Serbia and Slovenia and four years in Macedonia and Bosnia and Herzegovina(1).

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(1) Secondary teacherstraining schools have already closed in the following Republics: Montenegro (1963-64), Croatia (1965-66), and Macedonia (1963-64) - except for teacher training schools for national minorities. The study cycle in these schools was five years in Croatia and Montenegro and four years in Macedonia.

Graduates of those schools possess secondary qualifications and are called "combined-subject teachers for primary schools".

Other secondary schools preparing teachers

All such schools also enrol elementary school graduates.

The schooling lasts four to five years, after which graduates receive secondary qualifications and the title of special subject teachers (e.g. for physical training, musical education, etc.).

Higher teacher training schools

These schools prepare only single-subject teachers for higher grades (fifth to eighth) of elementary school. They enrol secondary school graduates (preferably from Gymnasia and secondary teacher training schools) or those without secondary qualifications who successfully pass an entrance examination.

Students are either full-time or part-time and the study cycle lasts two years (in Croatia it used to be three years(1).

Studies are organised in study groups, so that each student specialises in two subjects of instruction.

The graduates receive higher qualifications and the title of subject teachers.

Post-secondary teacher training schools (Pedagogic Academies)

Schools of this type were first established in 1960-61. According to the length of the study cycle, they can be divided into (a) two-year schools (four semesters), enrolling secondary school graduates (from Gymnasia, secondary teacher training schools, etc.); and (b) six-year schools, enrolling elementary school graduates (with the possibility of admitting secondary school graduates directly into the fifth year of study).

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(1) Higher teacher training schools no longer exist in Croatia (since 1963-64) and teachers of that level are trained in two-year post-secondary teacher training schools (Pedagogic Academies).

Two-year post-secondary schools have two streams: one for combined-subject and the other for single-subject teachers. In Croatia, the two streams have lately been merged into one, with possibilities of specialisation for either combined-subject or single-subject teaching in the course of study.

Students are full-time or part-time. Studies are organised by study groups or departments, combining, as a rule, two related subjects. There are also some one-subject departments - mainly for teachers of music, sculpture and painting and technical education.

Six-year teacher training schools are found only in Montenegro. In the first four years, teaching is organised along the same lines as in secondary schools, while in the fifth and sixth year it follows the lines of two-year post-secondary schools (and is broken down into semesters). The passage from fourth to fifth year is direct - there is no final examination at the end of the fourth year. Students are prepared to serve both as combined-subject and single-subject teachers.

Graduates of two-year or six-year teacher training schools receive higher qualifications and the title of subject teachers.

Other post-secondary schools preparing subject teachers

Such schools enrol secondary school graduates and offer a course of study of two years (four semesters). Only full-time students are admitted.

Graduates of these schools receive higher qualifications and the title of subject teachers.

Schools in this group include post-secondary schools for specialists in educational techniques, post-secondary schools of physical training, and post-secondary teacher training schools of home economics.

Teacher training faculties(1), colleges(2) and arts academies

These institutions prepare primarily teachers for secondary schools, young research workers and people who can work in cultural and other public institutions. Some of their graduates find employment in elementary schools too.

Graduates of teacher training faculties and colleges receive highest qualifications and the title of senior teachers.

2.1.1. Measures designed to ensure the supply of teachers required for reformed elementary education

Main aspects of elementary education reform

The reformed elementary education is compulsory for all children between the ages of 7 and 15: compared with pre-war and post-war elementary education (until 1958) this represents an extension of compulsory education from four to eight years. The new school unites the features of the former four-year primary school and junior grammar school (lower forms of Gymnasia) into a comprehensive eight-year compulsory school.

As a rule, the new elementary school embraces the following major activities: teaching and upbringing, extra curricular activities, physical training and health education, general cultural and public activities of the school.

The reform of elementary education provides for a much broader scope of teaching from the first to the eighth form, in view of the development and achievements of science. The educative function of the school is seen in the fact that it establishes a link between general knowledge and certain aspects of social life. Classical forms of teaching are giving way to a whole range of new methods and modern teaching aids.

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(1) Teacher training faculties include those of arts and letters and of natural sciences and mathematics.

(2) Teacher training colleges include colleges of education (only the one at Maribor for the time being), vocational teacher training colleges (only the one at Rijeka for the time being), colleges of defectology (for handicapped and retarded children teachers), and colleges of physical training.

The structure of the subject matter taught has also changed with the introduction of new subjects and topics of instruction and activities, such as the knowledge of nature and society (1st to 3rd form), education for production and technology (4th to 8th form), home economics (6th to 8th form), fundamentals of socialist morals (6th to 8th form), extra-curricular activities, school's social and cultural activities, etc.

The elementary school has changed its attitude towards the environment in which it operates. It has become a focal centre of varied activities designed to spread knowledge and education among the people; it enables adult citizens to supplement their education by attending evening classes, courses and other forms of education(1).

All these changes have naturally resulted in a need for a different, more rational and adequate system of teacher training.

2.1.2. Reforms in the system of teacher training

In accordance with the educational and social assumptions of the elementary education reform, certain changes have also become necessary in the system of teacher training. The system that is now being evolved will have to provide for -

(a) a systematic and uniform training of all categories of teachers for elementary schools (for combined-subject and single-subject teaching and for technical, musical and artistic education);

(b) the upgrading of all categories of teachers to a higher level of education (that of post-secondary school), by giving them broader general culture, more sound knowledge of their own subject of instruction, and a more modern pedagogic, psychological, methodological and social outlook.

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(1) An analysis of the profiles of elementary school teachers, Yugoslav Institute for Educational Research, Belgrade, 1964.

The process of reform in the system and institutions of teacher training had started even before 1960, but it was hampered by the extreme efforts that were then being made to meet quantitative needs for teachers. Those needs had been caused by the sudden increase in the number of educational institutions in the country in the post-war period and by the extension of compulsory elementary education from four to eight years.

In 1960-61, however, the process of closing the existing secondary and higher teacher training schools began, and these are now being replaced by a uniform type of teacher training school - the two-year post-secondary teacher training school (Pedagogic Academy). This new post-secondary school now prepares all categories of teachers needed in the elementary school. This is a self-contained school whose graduates enter into the teaching profession, but it is also open towards teacher training faculties and colleges at which its graduates may continue education in the third year of the appropriate study group.

This system of teacher training for elementary schools is gradually developing in several variants in different parts of Yugoslavia.

2.1.3. Problems arising in connection with the implementation of the system of teacher training for elementary schools

The most important problem in the training of subject teachers is that of the possible combinations of subjects in study groups. The teaching of different subjects of instruction in the upper grades of elementary school (from fifth to eighth grade) requires teachers who will be specialists in the subjects they teach. However, very few subjects of instruction are given more than two periods a week, which means that a school would have to have 16 upper grade classes if it wanted to employ a full-time teacher specialised in only one subject of instruction. Together with the corresponding number of lower grade classes such a school would have to have the total of 32 classes. But in most parts of Yugoslavia the majority of elementary schools are much smaller, with a smaller number of classes. There are actually many schools with only one class in each of the upper grades (fifth to eighth).

It is obvious therefore that teacher needs can best be met, and available teachers best employed, if post-secondary teacher training schools (Pedagogic Academies) offered two-subject study courses.

Compared with the situation at the present time, this implies a reduction in the number of one-subject study groups and the structuring of two-subject study groups according to the needs of elementary schools. The existing situation in this respect is rather confused. The lack of any firm planning of subject teacher needs has been responsible for idiosyncratic decisions on the part of individuals and teacher training institutions without regard to the needs of schools.

It is also important to work out more detailed profiles of teachers needed for each subject in view of its role and significance in the programmatic structure of the elementary school. The profiles thus established should become the basic criterion for the evaluation of the syllabus currently followed in the training of teachers.

The comprehensive and uniform elementary school requires also teachers with uniform qualifications and backgrounds. All elementary school teachers, both single-subject and combined-subject teachers, are required to have the two-year post-secondary qualifications. This applies also to those who already work as teachers without sufficient qualifications and who will have to acquire them by full-time or part-time study, or by attending seminars, courses, etc.

2.2. Training of teachers for secondary schools

Teachers in secondary schools are those with university and college, post-secondary or secondary qualifications.

Secondary school teachers are trained at the same kinds of university, college and post-secondary institutions as elementary school teachers. In addition, there is a vocational teacher training college for teachers of secondary technical and vocational schools, as well as special departments attached to certain two-year post-secondary teacher training schools.

Some of the teachers in secondary schools, particularly technical schools, are engineers, economists, lawyers, physicians and other professional people with degrees from different faculties but without any background in teaching.

2.2.1. Training of teachers for subjects in the general cultural and socio-economic fields and for physical training

These fields cover the following subjects taught at secondary schools: Serbo-Croatian language and literature with fundamentals of aesthetic appreciation, foreign languages, history, geography, physiology, sociology, fundamentals of social and economic system, philosophy, history of art, musical education, artistic education, physical training and health education.

Teachers for these subjects are trained at faculties of arts and letters, academies of music and fine arts, and at colleges of physical training. In a few instances, graduates from the faculties of law and economics also appear as secondary school teachers. It is a well-known fact that faculties of arts and letters, and even more so colleges of physical training and arts academies, are not institutions whose primary task would be the training of teachers. However, at this point we shall deal only with this aspect of their activities.

Faculties of arts and letters. These faculties (called Faculties of Philosophy in Yugoslav terminology) have the task of preparing personnel for schools and various cultural institutions. Priority is given to the training of future teachers for the humanities in secondary schools.

This explains why faculties of arts and letters offer largely two-subject courses of study.

In an attempt to satisfy as many secondary school requirements as possible, these faculties have been paying increasing attention to teaching techniques and psychology as part of their curricula, while for some subjects there are also compulsory courses in methodology. But in spite of this it can be said that the pedagogico-methodological and psychologic preparation of teachers is still inadequate. Different faculties approach this aspect of teacher preparation differently and set requirements with respect to these subjects.

Faculties of arts and letters enrol secondary school graduates, mainly those from Gymnasia and teacher training schools.

The course of study lasts four years (eight semesters) for both full-time and part-time students. Part-time students attend special consultation seminars and tutorials for 7 to 14 days every semester.

Arts academies. Unlike faculties of arts and letters, arts academies see the training of artists as their most important task. But they also have separate departments for the training of teachers of music and fine arts.

Music teachers for secondary schools are trained at teacher training departments of academies of music (or conservatories); teachers of fine arts are trained at corresponding departments of academies of fine arts. All students in these departments attend courses in teaching techniques, psychology and methodology.

For teachers of secondary schools of ballet there is no corresponding faculty or college, so that they are usually themselves ballet school graduates with many years of experience in ballet dancing.

Arts academies enrol secondary school graduates who can pass an entrance competition to demonstrate their gifts for the artistic field chosen.

The course of study lasts four years, with a degree of freedom that the nature of such academies demands.

Colleges of physical training. They have no special department for teachers of physical training. Their graduates are prepared generally to work in the field of physical culture. This situation has resulted in numerous problems and weaknesses in physical training in secondary schools that can only be removed by providing appropriate courses preparing students to work as teachers.

2.2.2. Training of teachers for natural science subjects and mathematics

These fields cover the following subjects in secondary schools: mathematics, physics, chemistry and biology; in technical schools they also include mechanics, fundamentals of electrical engineering and descriptive geometry.

Teachers for these subjects are trained at faculties of natural sciences and mathematics and in the departments of mathematics and applied physics of the Vocational Teacher Training College.

At some natural science and mathematics faculties there are special departments for post-secondary and college teachers.

Conditions of enrolment and the duration of the course of study are identical with those at faculties of arts and letters. Graduates are of two kinds: those from teacher training departments are senior teachers and those from other departments engineers of mathematics, physics, chemistry and biology. Departments of mathematics and applied physics of the Vocational Teacher Training College produce primarily teachers for technical and vocational schools.

2.2.3. Training of teachers for theoretical technical and specialist fields

These fields include fundamental technical and specialist subjects. Their choice depends on the occupation or branch of technology for which the training of personnel is being done.

In technical and vocational schools these subjects are taught by graduates from faculties of engineering, economics, medicine, etc. They usually come from industry or from other organisations and institutions; sometimes they keep their industrial or business jobs and teach only part-time. Since the faculties from which they come train personnel for business and social services, they rarely have any knowledge of teaching techniques and methods. The minimum of this knowledge they can acquire while preparing for the supplementary teacher examination which they take after two years of experience in teaching, Past experience has shown that the knowledge acquired for this examination is not sufficient for successful teaching.

Some of the technical subjects in secondary schools of mechanical engineering are taught by the graduates of the mechanical engineering department of the Vocational Teacher Training College. The course of study in this department lasts two years (four semesters) and the graduates receive the qualification of senior teacher.

This particular department of the Vocational Training College enrols students with two-year post-secondary backgrounds. They attend courses in industrial education, didactics, adolescent and educational psychology, statistics, research methods, and methodology of teaching technical subjects.

Other departments of the Vocational Teacher Training College enrol secondary technical school graduates, including graduates of schools for skilled workers who successfully pass an entrance examination. The course of study lasts two years (four semesters). The graduates receive the title of teacher.

The teaching of technical and specialist subjects in schools for skilled workers is done to a less extent by engineers, economists and similar people with high qualifications (some 30 per cent) and to a greater extent by people with post-secondary or in some cases even secondary backgrounds.

Teachers with secondary qualifications are mainly technicians and similar people from industry and social services. Those with post-secondary qualifications are usually the graduates of the metal and electrical engineering departments (two-year course) of the Vocational Teacher Training College. Sometimes one finds also graduates of two-year post-secondary schools of engineering acting as teachers.

Although, strictly speaking, all teachers in schools for skilled workers should have at least two-year post-secondary qualifications, there are many trades in which such teachers are not available, as no appropriate schools exist to train them. In this situation, schools for skilled workers are forced to seek teachers with university and college qualifications; these are, admittedly, better qualified to teach technical and specialist subjects but are unwilling to take up teaching posts because of inadequate material incentives.

2.2.4. Training of teachers of practical skills in the technical and specialist field

Practical skill teachers are needed, to a greater or less extent, in all technical and vocational schools. They are trained at the Vocational Teacher Training School, at its department of industrial education (two-year course).

During the two-year (four-semester) course of study particular attention is paid to the methodology and organisation of practical skill training and to the learning of educational techniques and psychology.

The graduates receive post-secondary qualifications and the title of teacher.

Only a small number of practical skill teachers in secondary technical and vocational schools have post-secondary qualifications. Most of them are just highly skilled workers or technicians who have mastered the essentials of educational techniques and psychology and passed an examination to qualify as teachers.

2.2.5. Training of teachers for organisation and promotion of instruction

Specialists in school organisation and promotion of teaching are trained at the Vocational Teacher Training College, which in 1962 introduced a degree course in industrial education. Only graduates of two-year post-secondary technical or teacher training schools, or people with long experience in vocational subject teaching, are accepted. The course of study lasts two years (four semesters) and the graduates receive the title of senior teacher - industrial educator.

The posts of school educators, are filled also by those graduating from departments of education at faculties of arts and letters.

2.2.6. The strategy of ensuring teacher supply in view of the changes taking place in secondary education

Secondary education is already undergoing significant changes that will have direct repercussions on the strategy of ensuring teacher supply.

The system of secondary education for both young people and adults is noticeably inadequate to satisfy present-day and future manpower needs. The educational structure of the active population is unfavourable, and numerical relations between different kinds of personnel now being trained do not correspond to planned requiremeznts. Too few people with secondary qualifications enter into production, while on-the-job or part-time training is insufficiently developed.

Unjustified differences in subject matter, level and organisation of instruction in vocational and technical schools still exist and hamper the development of the entire educational system.

There is not enough co-ordination between education and training in schools and outside the regular educational system: each of the existing types of education and training is closed in itself.

The dynamic development of science and technology, production organisation, processes and relations, as well as the introduction of mechanisation and automation, imposes the need for such secondary education which will give broad general and technical knowledge as a sound basis for continuous and successive specialisation.

Modern secondary education, a synthesis of general and technical education, contains, in addition to its humanist, mathematical and natural science component, also a component of technical culture based on the theoretical knowledge of the application of science in production and other social activities and on the practical participation in productive and other socially useful forms of work.

By making the system of education democratically open, all citizens are given equal opportunities to acquire the knowledge needed for productive work or for further education to the point to which they wish to proceed in accordance with their interest, ability and diligence. In this way we hope to eliminate the remains of the [illegible]alism that are still felt in the educational system at its present stage.

As a result of such requirements, the level of knowledge in the humanities, natural sciences and mathematics has already considerably risen in schools for skilled workers.

General technical education, linked with periodic spells of practical work in production, has already found its place in the curricula of Gymnasia. The acquisition of practical skills is given increased importance not only in schools but also in industrial and business organisations and social services.

It is a common feature of all secondary schools that general subjects are grouped in the first two years, while occupational specialisation (according to the type of school) is left for the remaining years.

Thus, it may be said that comprehensive secondary education includes the humanities, natural sciences, technical education and productive work, all of which are interdependent components of a unique whole.

The development of the social and economic relations in the country is forcing schools to tackle a whole series of questions that used to be, at the time of centralised administration of the affairs of the country, under the exclusive responsibility of government organs.

Thus, for instance, educational institutions are now responsible for keeping accurate and up-to-date records and documentation of their work, which will make it possible for them to make independent analyses and evaluation of their results.

Also, schools are now free to determine the profile of personnel they are going to train and in this connection they make their own syllabuses and curricula on the basis of broadly outlined requirements imposed by the society.

Schools are gradually introducing the system of operative programming of instruction and developing follow-up schemes.

Secondary schools are faced with the task of producing the greatest possible number of graduates prepared to take part in productive and other socially useful activities.

A planned and careful pedagogic guidance of each pupil designed to enable him to achieve maximum results of which he is capable requires a sound educational preparation of the teacher himself. The principle of individual approach makes it necessary to apply the achievements of cybernetics in teaching (e.g. programmed learning and programmed textbooks). In order to be able to follow his pupils' progress, the teacher must be versed in the preparation and administration of tests, questionnaires and other procedures; he must also have a deeper knowledge of the theory of learning and educational psychology. In short, to be a good teacher he must know modern pedagogic theory and practice, methods and techniques, which used to be a rather neglected aspect of teacher training in the past.

2.2.7. Changes in the profiles of teachers and in their training

Changes in the character of secondary education have necessitated corresponding changes in the syllabuses and curricula of secondary schools. Some subjects of instruction will be dropped and their subject matter incorporated into other subjects, some of them newly introduced.

Thus, for instance, the teaching of literature covers the entire field of esthetic education (notably fine arts and music), so that there are schools in Yugoslavia in which an integrated subject of instruction, called "general culture", has been introduced. However, it is only from the academic year 1966-67 that faculties of arts and letters allow students to combine the study of literature and that of the history of art.

The introduction of technical education into the educational structure of secondary schools poses the problem of linking natural sciences and technical education. Traditional teachers of physics and chemistry find it rather difficult to relate the teaching of natural sciences to the fundamentals of engineering science, technology and production procedures. However, some attempts have already been made to ease the problem a little. The training of teachers at the Vocational Teacher Training College is organised so that the link between natural and technical sciences can be easily established. The programme of study provides even for periods of practical work that students must spend in industrial firms and workshops.

At other teacher training institutions and faculties more attention is to be given to the study of psychology, educational techniques and methodology, with practical work, so that at least 20 per cent of total time in the course of study is spent on these aspects of teacher training.

This approach to the training of teachers will require a modernisation of equipment in teacher training schools and faculties. In addition to laboratories and workshops for technical subjects to which considerable attention is already being paid, it will be necessary to equip learning laboratories, psychological laboratories and experimental classrooms in which students will get their practical training and experience in teaching.

Apart from regular training in educational techniques for students of teacher training schools and faculties, supplementary courses in psychology, education and methodology will be provided for those graduates of the faculties of engineering, medicine, economics, etc. who are planning to become secondary school teachers of their special subjects. Their knowledge of educational techniques should not be appreciably inferior to that acquired by the students of teacher training schools and faculties.

It follows from everything said here that the future development of secondary education will require teachers with highest professional and pedagogic qualifications. Post-secondary education, with essentials of psychology and educational techniques, will be sufficient only for practical skill and technology teachers.

Those who will perform specialised functions in the process of education, such as educational consultants, school educators, adult education specialists and similar, will have to receive additional training at teacher training schools and faculties. For some of them post-graduate courses leading to a masters degree will have to be provided on a scale larger than in the past.

2.3 Experiences in attracting students to teacher training schools

In addition to increased training capacities and qualitative changes in the structure of teacher training schools, it was also necessary to stimulate greater interest among young people for the teaching profession.

The most important and effective measures in this direction have been the following:

- providing material benefits for pupils and students of teacher training schools and faculties (scholarships, accommodation in student halls of residence, paid leaves of absence from work during the period of supplementary training, cheaper meals, student loans, etc.);
- improvement of teachers' economic and social status;
- scattering post-secondary teacher training school in smaller towns where the costs of living are lower, so that more young people can afford to attend these schools.

It should be noted, however, that excessive scattering of schools has some disadvantages too. Some schools are small and unviable and education in them uneconomical. School space, equipment and teachers cannot in such cases be properly used. Small schools are especially numerous among two-year post-secondary schools (the average number of students is 340) and something will have to be done soon to reorganise the network of these schools.

It has already been decided to retain a smaller number of well organised and equipped schools with adequate accommodation facilities for students from more distant areas. Suitable residential accommodation and other forms of material benefits for students would ensure a steady supply of students for all teacher training institutions.

Table 13: Scholarships provided for pupils(1) and full-time students in teacher training institutions

	Total number of pupils and full-time students	Receiving scholarships		Number of students receiving salaries	Number of students receiving children's allowance
		number	%		
1. Secondary teacher-training(2) schools					
1955-56	20,499	3,519	17.5	-	-
1960-61	27,950	10,194	36.5	-	-
1964-65	28,942	6,410	22.1	-	-
2. Two-year post-sec. teacher training schools					
1955-56	4,680	1,002	21.4	-	1,044
1960-61	6,078	1,760	29.0	250	1,016
1964-65	10,528	1,891	18.0	238	2,228
3. Teacher training faculties, colleges and arts academies					
1955-56	16,804	2,269	13.5	-	7,473
1960-61	15,513	3,256	21.0	459	5,534
1964-65	18,591	3,217	17.3	703	7,903
TOTAL: 1955-56	41,983	6,862	16.3	-	8,517
1960-61	49,541	15,210	30.7	709	6,550
1964-65	58,061	11,518	19.8	941	10,131
Other secondary schools, faculties and other higher institutions					
TOTAL: 1955-56	282,801	23,522	8.3	...	13,375
1960-61	404,368	62,688	15.5	6,652	24,150
1964-65	591,183	46,329	7.8	2,549	30,307

(1) Figures refer to the end of each academic year.

(2) Without secondary arts schools; including schools for nursery-school teachers.

Scholarships, as a major form of providing material benefits to pupils and students, are given at all levels of teacher training. The highest percentage of those receiving scholarships used to be found among the pupils of secondary teacher training schools (36.5 per cent of all those enrolled were receiving scholarships in 1960-61); the percentage was lowest in higher education teacher training institutions (only 21 per cent in the same year).

However, the percentage of those receiving scholarships is twice as high in teacher training institutions as in other types of secondary and higher education institutions.

The number of scholarships was on the increase between 1955-56 and 1960-61 but later it started to decline. The decline in scholarships was due to the fact that scholarships are now gradually replaced by interest-free student loans which are regarded as a more effective method of creating favourable conditions for study and successful completion of education.

In view of the grave shortage of teachers for some types of schools, students of teacher training institutions get priority treatment in obtaining student loans. In some of the Republics, up to 40 per cent of all funds earmarked for student loans are used by those training for the teaching profession.

2.4. Part-time training of teachers

In addition to the training of full-time students, post-secondary teacher training schools, colleges and faculties play an important role in the supplementary training of inadequately qualified combined-subject and single-subject teachers. This supplementary training is largely part-time, which means that such teachers work on their jobs and use their free time to study (for instance, during winter and summer vacations). Occasionally they are given shorter periods of paid leave to attend lectures, take examinations, etc.

Below we give some statistics concerning this aspect of activity of teacher training institutions:

Table 14: Part-time teacher training institutions

Type of school	Number of part-time students 1955-56	1960-61	1965-66	Index 66-56
1. Two-year post-secondary teacher training schools	2,450	3,816	10,918	445.6
- higher teacher training school	2,449	3,519	6,314	257.8
- higher vocational teacher training school	-	184	-	-
- two-year post-secondary teacher training school (Pedagogic Academy)	-	-	4,197	-
- institute of physical culture	1	-	-	-
- post-secondary school of physical culture	-	-	-	-
- Federal Gymnastics Instructor Course	-	56	98	-
- post-secondary school of home economics	-	1	16	-
- post-secondary school for special educators	-	-	181	-
2. Teacher training faculties colleges and academies	3,666	6,149	6,531	178.2
- faculty of arts and letters	3,425	4,933	3,515	102.6
- faculty of natural sciences and mathematics	154	1,144	1,571	1,020.1
- vocational teacher training college	-	-	369	
- two-year post-secondary teacher training school (Pedagogic Academy)		-	318	-
- college of physical culture	17	68	480	2,823.5
- college of defectology	-	-	241	
- arts academies (fine arts and music)	70	4	37	52.9
TOTAL	6,116	9,965	17,449	285.3

In view of the high percentage of inadequately qualified single-subject teachers in elementary and secondary schools, much more attention will have to be paid to this form of teacher training, with the active assistance of those responsible for the promotion of educational techniques in the schools in which such teachers are employed.

3. TEACHER EMPLOYMENT AND REMUNERATION POLICY

3.1. Teacher employment and remuneration in accordance with the Law on Civil Servants, between 1958 and 1961

The Law on Civil Servants presented a uniform system of employment and remuneration in the civil service; it regulated appointments and promotion and all other matters concerning the legal status of civil servants. However, although the main elements were identical for all public services, their implementation differed sufficiently to take into account the specific nature of work in each particular service.

Teaching appointments in schools were made by public competition. Published advertisements of vacancies inviting applications usually listed all general and special requirements for the post in question.

Applicants submitted their applications to the school board of the school that had advertised vacancies. The school board would consider the applications received and send them, together with its opinion, to the appointments committee. This committee reported to the communal board of education which actually appointed the chosen applicant.

Appointments of headmasters were also made by public competition. But the selection of a headmaster was made by the communal authority (People's Committee of the Commune) and the appointment was signed by the President of the Communal People's Committee.

The teaching posts that remained vacant even after the job had been advertised, as well as those that fell vacant in the course of the academic year, were filled by part-time teachers on a permanent basis, with contracts for a specified period of time but no longer than the end of the academic year in question. If the post remained vacant even in the second attempt, and if this jeopardised the process of teaching in that school, the appointing body (i.e. People's Committee of the Commune) could assign a teacher from another school in the same Commune to fill this post for a specified period of time which could not go beyond the academic year for which the appointment was made.

Part-time teachers could be employed without competition for jobs of occasional or temporary nature which were not included in the school's job plan or which did not require full-time work. Conditions of part-time employment were regulated by contracts.

According to this Law there were three categories of teachers: full-time, Part-time on a permanent basis, and part-time. Full-time teachers and part-time teachers on a permanent basis enjoyed equal rights as far as labour relations were concerned.

Teacher salaries

The basic salary of every teacher was determined by his qualifications and years of service; his "rank salary" depended on the importance of the post he occupied or on his qualifications.

Every civil servant belonged to a certain "rank" according to his professional qualifications; within this rank he belonged to a certain salary class according to his years of service and experience.

Salaries were determined for each salary class. In top salary classes of each rank there were periodic salary increases.

In addition to general civil servant ranks (such as the rank of a civil servant of first, second, third or fourth grade), teachers in elementary and secondary schools were also grouped in the following ranks: primary school teacher, practical subject teacher, skill teacher, subject-teacher and senior teacher.

The ranks of primary school teacher, practical subject teacher and skill teacher corresponded to the rank of third grade civil servant. The only difference was that teachers belonged to one salary class above that of other civil servants with secondary education. A provision to this effect was made in the Law and it applied only to teachers.

The rank of subject-teacher (with post-secondary qualifications) corresponded to that of second grade civil servant; that of senior teacher (with university qualifications) to that of first grade civil servant.

The Law on Civil Servants made provisions also for the post of educational consultant. This post was open to teachers, skill teachers, subject-teachers and senior teachers who became prominent in their teaching and who co-operated actively in the work of professional and scientific institutions in the field of education and contributed to the development of educational theory and practice.

Teachers that were appointed educational consultants were given two salary classes (or only one) above the class they had had before.

Within the same rank teachers were regularly promoted to the next higher salary class every three years (after they had taken their professional teacher examination) provided their merit rating reports at the end of each year were satisfactory.

"Rank salaries" were received by all teachers systematised in salary classes. "Rank salaries" for teachers were determined by the posts they filled; for administrative posts they depended on the importance of the post (e.g. for headmasters, section heads in technical schools, etc.).

The Law determined the range of "rank salaries" and the authorities who founded or financed schools decided - according to their financial situation - on the exact amounts within stipulated ranges.

In addition to basic and "rank" salaries, teachers could get certain allowances or benefits under specified conditions: supplementary salary for the number of hours taught above the standard; allowance for teaching under difficult conditions, for teaching in special schools or classes, in experimental schools or classes; payment for work with more than a normal number of pupils, with more than one form in one class, or with more than a normal number of pupils in several classes.

Teachers in villages were given free accommodation and fuel.

3.2. Teacher employment and remuneration under the system of self-government (since 1961)

The new method of teacher employment and remuneration is based on the provisions of the Basic Law on Labour Relations and the Basic Law on Institutions and Internal Legislation in Working Organisations. The stipulations of these two laws apply to all workers and employees, as well as working organisations, in the field of economy and public services. This means that teachers now enjoy equal rights and share equal responsibilities as all other workers and employees.

Unlike the former system, the new one gives working organisations and their employees a greater degree of freedom. Thus, working people in schools, exercising their rights of self-government but in compliance with the general principles stipulated by law, decide how and with whom the labour relation will be established. They are also independent in the distribution of their income.

The labour relation is now no longer established between the worker and the working (or business) organisation: rather, working people now establish mutual working relations and independently define the rights and duties that stem out of their associated labour.

It is particularly noteworthy that the selection and appointment of new teachers is no longer done by the communal or district board of education but by the school itself and its self-government bodies.

Teaching vacancies are as a rule filled, as before, by public competition. The school may decide when a vacancy can be filled without formal advertising or competition (e.g. when there is a temporary need for more people, when a teacher is on a sick leave for a long time, etc.). The post of headmaster must be filled by public competition.

The general conditions of employment (or establishment of labour relations, in Yugoslav terminology) are determined by law; special conditions are set up by the school itself.

Vacancies are formally advertised by the school board and applications are received by the appointments committee chosen by the school board from among the members of the staff. The appointments committee reports to the teachers' council which suggests the names of those to be chosen to the school board. Acting on this suggestion, the school boards select the future teachers. Appointments are signed by the headmaster.

The headmaster is appointed in accordance with the same procedure that is followed in the selection of general managers (or directors) in all other business organisations. Applications are invited by competition and are received by the appointments committee. Three members of that committee are nominated by the school board and three other by the founder. The selection is made by the school board acting on the proposal of the appointments committee.

The competition for the post of the headmaster is repeated every four years. The headmaster already occupying that post may apply and be reappointed. In case that he is not reappointed, he is entitled to ask the school board to assign him to another job suitable for his abilities and qualifications. If he refuses to work on the job to which he has been assigned his employment terminates.

The school may also stipulate a probationary period as one of the conditions of teacher employment. The probationary period is intended only to test the teacher's professional skill and ability and see whether they satisfy the requirements of the job for which he is applying (i.e. to see whether he can successfully perform on that job). A positive assessment of his work during the probationary period ensures his employment, while a negative assessment means that his work in that school ends. The teacher receives a written report on his performance during the probationary period.

If a teacher on probation feels that the job to which he has been assigned is not suited to his abilities, he can leave at any moment without an explanation. Thus the practice of probation work gives the teacher greater freedom in choosing the job and conditions of work that are suited to his abilities. The school, on its part, ensures in this way that a vacancy will be filled by the teacher who will prove most successful on that particular job.

The length of the probationary period must be realistically determined and must not exceed the time that is needed to make a reliable assessment of the candidate's performance.

Under the new system, the distinction is no longer made between full-time teachers, part-time teachers on a permanent basis, and part-time teachers paid by the number of hours worked. There is only one type of labour relation and only one type of legal status for those employed. The labour relation (or employment) is established, as a rule, for an unspecified period of time; only exceptionally can it be established for a specified period of time. The latter is the case when the nature of the work to be performed is such that it can last only for a certain period of time, or when the pressure of work is temporarily increased, or when a replacement is needed for a teacher conscripted for military service or otherwise absent (on a prolonged leave of absence, elected to a public office, etc.). The cases in which this is done are determined by the school authorities themselves.

The new law no longer speaks in terms of regular working load and overtime, but it introduces the categories of full working hours, shorter working hours and extended hours of work.

Every worker and employee is entitled to a 42-hour week (full-time work). In the case of teachers, this includes also the time they spend preparing for classes. The amount of time granted for preparatory work (and recognised as part of the teacher's regular work) is determined by law and by the school's statute. The teacher may work even shorter hours than those stipulated by law - but only on jobs which the school has listed as such. This is usually allowed on jobs whose scope does not require full working hours and on those where it is necessary to supplement the work of teachers who are legally entitled to shorter working hours.

The teacher who works at least half of the regular working hours enjoys all rights of employment granted by law and the statute of the school. As for the rights that are based on the number of hours worked or on the contribution the teacher has made, these are determined according to the stipulations of the school's regulations on the distribution of earnings.

The teacher who works less than half of the regular working hours is entitled to participate, as an equal member of the collective, in the management of the school's affairs and in the share of earnings proportionate to his contribution to the success of the school. Such a teacher is covered by social insurance against accidents at work and occupational diseases. The type and scope of his other rights are determined by the school authorities in accordance with the law and with his contribution to the success of the school.

The remuneration of teachers on the basis of the distribution of earnings and of the results of work is a radically new feature compared with the earlier centralised budgetary-system. The new system reflects favourably on the autonomy of the school and its working people and on the development of new socio-economic relations in the school.

This system is an integral part of the social and economic system of the country as a whole. Self-government, operation on the principle of earnings, remuneration by result - these are the major features of the Yugoslav social and economic system and these are the ones that must find their expression also in the sphere of education. The equalisation of the material and social status of all working organisations gives the schools a more equal and favourable footing and opens the way towards a system of economic and rational operation, similar to that in other branches of activity.

The school no longer receives funds from the budget. Rather, it demands the compensation of expenses for the fulfilment of its programmes of activity. The money thus received represents its earnings, which it then distributes independently. Thus the school stands, in relation to the community or to its founding or financing body, as an independent and self-governing institution.

By their work, teachers, members of the school working collective, earn an income which they later distribute according to the principles and criteria that they have established themselves. Thus they exercise their right of self-government: they run the affairs of the school and decide on the use of the resources they have earned.

There is no uniform system of fixed salaries any more. There is only a uniform principle of the distribution of earnings in accordance with the results of work; all details are worked out by the school itself on the basis of this general principle. the Working collective of the school formulates and adopts the financial plan and distributes the funds earned by the school: part of them goes for material expenses, depreciation and various operative funds and the other part for staff salaries. The part distributed in salaries should be commensurate with the school's work and results.

The principles and criteria for remuneration are set out in a normative document adopted by the school, namely, the regulation for the distribution of personal incomes. Every teacher receives monthly advances on salary until periodic accounts are made every three or six months. The final account is made at the end of the year when the annual balance sheet is prepared.

The remuneration received by a teacher depends on the amounts earned by the school, on the care with which these funds are spent, on the efforts of the teacher himself and his results, etc.

In practice one meets a number of remuneration methods, which is a positive sign in as far as they reflect specific conditions in different schools. However, they can more or less all be reduced to two main methods:

(a) The first method of remuneration takes as its starting point the jobs that the teacher performs and his success in performing them.

This method is based on job evaluation or a job plan. The evaluation of jobs is made in the manner best suited to the nature of work performed or to the organisation of the school itself and is expressed either in points or in money terms.

The principles and criteria of remuneration, as well as the procedures for the evaluation of the teacher's results, are worked out by the school. The major factors to be considered are the success in teaching, promotion of teaching techniques, and fulfilment of educational tasks. The teacher's success is judged by different methods and techniques: by oral examinations, written papers, tests and interviews in which his pupils demonstrate their mastery of the subject matter; it is also judged by the documentation about the pupils collected by the teacher, by learning contests organised by him, by his pupils' performance in higher forms, by their ability to apply their knowledge in practice, by their behaviour and habits, etc.

The results achieved by a teacher in his work are evaluated by the council of teachers after it has heard the report of a special comittee.

(b) The second method of remuneration takes as its starting point the quantity and the quality of both individual and collective work.

According to this method, teachers' salaries consist of the part derived from the quantity of work performed and another part derived from the quality of work and results achieved.

In addition to the teacher's quantitative obligations and his duty to work a specified number of hours, the council of teachers may stipulate certain pedagogic requirements that the 110 teacher should satisfy in order to receive the remuneration envisaged for the job in question. These requirements concern the timely fulfilment of the programme of instruction, careful preparation for classes, regular periodic tests of the pupils' knowledge, assistance to pupils in learning, application of didactic and methodological principles in teaching, orderly documentation, etc. Teachers who fail to fulfil all these duties satisfactorily receive reduced salaries (in accordance with the provisions of the regulation for the distribution of personal incomes). This variable part of the teacher's salary, depending on how well he satisfies these requirements, is paid monthly.

The part of the teacher's salary received on the basis of the quality of his work is an expression of his professional and pedagogic individuality, of his contribution to the success of the school, and of his personal success in work. Thus, it becomes an expression in money terms of the teacher's personal success in work and an economic incentive for a steady improvement of the methods of teaching with a view to achieving even better results in teaching and education.

The criteria and units of measurement applied in the evaluation of teachers' results, as well as the amounts of money for this part of teachers' salaries, are established by the council of teachers, taking into consideration the following components: general and pedagogic preparation for teaching, application of modern teaching methods, aids and forms, elaboration of prescribed programmes of instruction and of supplementary optional ones, care for the pupils' success and progress, co-operation with other teachers in the solution of the school's problems, co-operation with parents and other bodies that might affect the development of the school and its success; special weight is given to considerations of discipline, diligence and conscientiousness in work.

This method provides for different kinds of supplementary payment schemes: for educational qualifications and skills, for years of experience, for difficult conditions of work and life, for managing the affairs of the school, etc.

Some encouraging results have already been achieved in the application of the new system of distribution of personal incomes and remuneration by result. These results justify further efforts in the development and improvement of this system.

4. CONDITIONS OF WORK FOR TEACHERS

4.1. Working conditions in schools

In the period immediately after the war Yugoslavia was faced with a very difficult and important problem of normalising the conditions of work in the sphere of education. Because of the consequences of war-time destruction and because of the accelerated inflow of pupils to schools, the problem has not been fully solved until the present day in spite of colossal efforts made in this field. That is why the conditions of work are still unsatisfactory, though not equally difficult in all areas.

The present chapter will be devoted to the conditions of teachers' work - primarily to the load they carry in terms of pupils, subjects and teaching hours and to some other factors that affect their work (school space and equipment, territorial factors, etc.).

4.1.1. Teaching load in elementary schools

Although the pupil/teacher ratio in elementary schools has been steadily improving, the situation is still far from satisfactory.

Available statistics show that the number of pupils per teacher was 36 in 1958-59 and 30 in 1964-65. Considering the norms of 25 to 28 pupils per teacher that the different Republics have chosen, it becomes clear that the norms are not yet met but that the situation is improving from year to year.

The figure of 30 pupils per teacher is an average one for the whole of Yugoslavia. However, there are areas in which the situation is much less favourable because of the uneven distribution of teachers and because of some other reasons. The uneven distribution is seen in an excessive load on teachers in some schools and for some subjects and in the existence of very small schools in thinly populated areas which make for the low average ratio. This does not necessarily mean, however, that teachers in such schools work less, as they often have to teach parallelly in different forms.

Teachers who have graduated from one of teacher training schools (such as a higher teacher training school or a two-year post-secondary teacher training school) are usually accepted as qualified to teach one subject and only occasionally two subjects.

At the time of the 1962 Teacher Census, over 62 per cent of all elementary school teachers (including combined-subject teachers) taught only one subject, 19 per cent taught two subjects, 8.5 per cent three subjects, and 6.6 per cent four or more subjects. There were also 3.6 per cent of teachers not taking direct part in teaching. These were mostly headmasters, who did not, at least until recently, do any direct teaching.

The preparation for the teaching of the subjects for which the teacher is not formally qualified naturally requires more effort and time and therefore represents an additional burden.

One of the indicators of teacher load is the number of periods taught per week.

There are no uniform rules valid for the whole of the country as to the number of hours that a teacher should teach every week. The standards are set by Secretariats for Education and Culture in different Republics and they range between 20 and 24 hours a week, depending on the subject taught.

However, these standards are adapted to suit the conditions in which a particular school operates.

4.1.2. Teaching load in secondary schools

Figures relating to the number of teachers and enrolments in secondary schools indicate that the inflow of teachers has not matched increased enrolments. The pupil-teacher ratio is therefore deteriorating.

In 1958-59 the average number of pupils per teacher was 21; in 1964-65 it was 23. The situation deteriorated most in secondary teacher training schools and Gymnasia where the ratio stood at 22 and 23 pupils respectively, in 1964-65. However, the situation is not critical in view of the fact that the standard or normal ratio is 20 pupils per teacher.

As for the number of subjects taught by each teacher, statistical data show that there are many teachers in secondary schools teaching two subjects or more. This should not be taken merely as an indication of the fact that there is a shortage of people for some subjects but also as a desire to give all teachers the full number of periods, which they cannot have by teaching only one subject(1).

Most of the teachers teaching three, four or more subjects are found in schools for skilled workers and in those training personnel for various service activities. About 18 per cent of all teachers in such schools teach more than two subjects (8.8 per cent of them are part-time teachers). It is interesting to note that the percentage of such teachers is pretty high in secondary teacher training schools (16.3 per cent), technical and vocational schools (15 per cent), and much lower in Gymnasia (9.5 per cent).

The teacher load is even better illustrated by the data on the average number of hours (or periods) taught every week.

Thus, for instance, 27.5 per cent of teachers in schools for skilled workers teach more than five hours a day; in technical and vocational schools the percentage is 24.2 and in teacher training schools and Gymnasia 18 per cent of all full-time teachers.

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(1) A much better and more rational solution should be the teaching of one subject by the same teacher in several schools, instead of his teaching several subjects in one school. This solution is now being gradually introduced, especially in school centres uniting a number of schools, but it is not yet sufficiently widespread.

However, teaching is not the only duty that teachers have. In addition to this type of work, they also take part in pupils' extra-curricular activities, circles, clubs, etc.

4.2. Participation of teachers in activities other than teaching

According to the data obtained by the 1962 Teacher Census, some 80 per cent (or 74,000) of all elementary school teachers and 75 per cent (or 16,000) of all secondary school teachers take part in activities other than teaching.

In elementary schools about 63 per cent of teachers spend up to six hours a week on activities other than teaching; about 22 per cent of teachers spend between seven and twelve hours on such activities, and some 6 per cent of teachers spend on them more than 13 hours a week, in addition to their regular teaching hours.

The situation in secondary schools varies considerably depending on the type of school. While the majority of teachers in technical and vocational schools spend up to six extra hours on activities other than teaching, in Gymnasia and teacher training schools there are 11 per cent of teachers who spend over 13 hours a week on such activities. In teacher training schools alone there are over 6 per cent of teachers who spend more than 19 hours a week on extra-curricular activities, in addition to regular teaching. It follows from the above that extra-curricular activities are better developed in teacher training schools and Gymnasia, that methods of work with pupils are more versatile there, and that this requires more of the teachers' time.

Pupils' extra-curricular activities include work in cultural societies and clubs, in Popular Technology clubs, sports clubs, school co-operatives, and various groups such as the group of writers, young nature lovers, farmers, etc. Such extra-curricular activities are regarded as very important, not only because of their instructive contents and methods of work, but also because of their educative value in preparing young people for life and work under the conditions of self-government. These activities are usually organised in such a way that pupils themselves can run them, while teachers are there only to offer advice and guidance when needed.

Learning contests. Contests in mathematics have been arranged for a number of years now; contests in physics, chemistry and biology for elementary and secondary school pupils have lately been introduced too. Such contests are organised by the Society of Mathematicians and Physicists with the co-operation of teachers and educational authorities.

Two years ago a national "Science to the Young" movement was started which has already done much to awaken the interest of young people for science and to involve thousands of pupils from all parts of the country in scientific contests at different levels.

The "Science to the Young" movement encourages pupils to develop their interests in a particular branch of science beyond the limits set by school programmes of instruction. The movement pays particular attention to the proper development of young people who show inclination and ability for scientific research.

4.3. Rationalisation of teachers' time

A teacher's total working time is spent on teaching itself (20-24 hours a week), preparation for teaching (10-12 hours), participation in pupils' extra-curricular activities and in the work of school management bodies (4-6 hours), which gives the total of 42 hours a week. The teacher who performs the function of a classmaster must also engage in considerable administrative work (writing pupils' registers, writing marks in the main book, keeping records of absent pupils, making statistical surveys of results in learning and behaviour at the end of classification periods, and preparing term certificates and reports).

Teaching is, as a rule, done by teachers alone - without any assistance - so that they must themselves prepare everything necessary for the lesson (e.g. mimeograph texts, produce simple teaching aids, prepare experiments, classify collections, etc.).

In more developed technical schools in which a great deal of time is spent in laboratory work (in schools of chemistry, electrical engineering and similar) there are usually special laboratory technicians who conduct and supervise these laboratory exercises.

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Although much of the work that has to be done at school cannot be separated from the work of the teacher, there are some jobs that could be performed by other people and service units. These include most of the clerical and administrative jobs and routine preparatory work for teaching (mimeographing texts, borrowing educational films and film-strips, maintaining and servicing audio-visual equipment, etc.). In this way, the teacher would have more time for direct contacts with pupils.

In small schools employing hardly a dozen teachers it may not be easy to have special people for such jobs. However, in schools with a great number of teachers, as well as in school centres, special service units could be set up to follow-up the results of education and promote teaching work. Such schools can afford the services of a specialist in education techniques and a psychologist, as well as of other people who will prepare teaching materials, keep records, compute statistics, etc. Unfortunately, the number of schools sufficiently developed to afford such services is still rather small. There has been a trend recently towards a concentration of secondary schools into bigger units, capable of developing their internal services, rationalising their work, studying specific educational problems, and sparing their teachers from spending time and effort on activities of secondary importance, thus enabling them to devote all their energies to the education of pupils.

4.4. School space and equipment as a pre-condition of teachers' work

School space and equipment is an indispensable prerequisite for normal educational work. However, in spite of considerable efforts made by the community to provide favourable conditions of work, the building of school space - due to shortage of funds - has not been sufficient to match increased enrolments.

The latest census of school space was taken in 1964 and it was found that there had been some improvement in comparison with the previous census of 1951. But it was felt also that the efforts made in that direction during this period had been inadequate.

Some 36 per cent of all elementary schools in Yugoslavia work in one shift; 56 per cent work in two shifts, and about 7 per cent in three or more shifts. In Bosnia and Herzegovina, for instance, about 14 per cent of elementary schools work in three or more shifts, whereas in Macedonia there are no more than 3 per cent of such schools.

The problem of school space and teacher shortage is in many instances tackled by setting up combined classes which have become a permanent feature of elementary education in remote regions and in branch schools.

In 1964-65 there were 15,737 combined classes with about 464,000 pupils in Yugoslav elementary schools. This means that some 17 per cent of all classes were combined, including about 16 per cent of all elementary school pupils. Combined classes are those in which pupils of at least two forms are taught together; there are cases even of three, four or more forms sitting together in the same classroom. The highest percentage of combined classes, 26.7 per cent, is found in Montenegro, while the lowest, 13.1 per cent, is in Slovenia.

Work with such classes is quite difficult for teachers, as they have to teach different things at the same time, using different methods and following different curricula.

It should also be borne in mind in this connection that the quality of existing school space is often poor and inadequate.

Out of the total number of elementary school buildings in Yugoslavia, only a little over 50 per cent have been built after World War II, while some 16 per cent of them are more than 65 years old. Besides, over 22 per cent were not built as schools in the first place and are only used as such because of the shortage of school space.

The situation is similar with respect to secondary schools, but there the average classroom area for the whole country is sufficient and the shortage is only felt in auxiliary teaching space, such as laboratories, workshops, libraries, gymnasia, etc.

One of the important factors of successful teaching is good school equipment. However, because of the rapid expansion of education in the past period, available funds supplied by the community have been spent largely on the financing of the school's basic activities (i.e. teaching) and on the construction of school space most urgently needed.

4.5. Teachers' living conditions

Although teacher salaries represent an important item in total educational expenditure(1), they are still lagging behind the salaries of comparable groups of people in the productive and non-productive branches of the economy.

The situation has improved lately, however, and teacher salaries have risen approximately as much as those in other branches.

But the material status of teachers is still less favourable than that of other working people with similar qualifications employed in other types of working organisations.

Great efforts have been made in recent time to improve the material situation of teachers. Despite this, the situation cannot be regarded as satisfactory, especially in view of the fact that the educational backgrounds and qualifications of those working in education are far above the average for other sectors.

Efforts to increase teacher salaries are certainly a positive development and are expected to continue until the incomes of those employed in education reach the level of incomes of people with comparable qualifications employed in other sectors.

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(1) According to the data supplied by the Federal Economic Planning Bureau, the percentage of basic expenditure (excluding investments) that went on teacher salaries between 1961 and 1964 was 87.6 per cent in elementary schools and 74.1 per cent in secondary schools.

One of the serious reasons why a certain number of graduates of teacher training schools and faculties fail to enter into the teaching profession, or why some people leave the profession, is a grave shortage of housing facilities for teachers.

This shortage is a consequence of the lack of funds for this purpose in communal budgets and of inadequate resources provided for education generally.

The problem of housing is particularly difficult in rural areas. With the introduction of compulsory eight-year elementary education many new teachers came to villages and communal authorities found it impossible to provide accommodation for all of them. Many teachers have therefore been forced to live in substandard housing conditions, which can be regarded as an important cause of high turnover of village teachers.

However, serious efforts have been made recently to improve the situation as quickly as possible.

Thus, for instance, in Croatia alone some 400 flats have been distributed to teachers in 32 underdeveloped Communes in the last five years, which gives an average of 80 flats a year.

5. OTHER FACTORS THAT INFLUENCE THE QUALITY OF TEACHERS WORK

5.1. Teachers' further training

In order to improve the quality of education work in schools, it is not sufficient to improve the quality of training in teacher training institutions; it is equally necessary to evolve a system of further training for teachers, in their subjects and teaching techniques, to be better able to meet the needs of schools. No school, not even a teacher training one, can provide education that will be sufficient for ever, that will not have to be supplemented and expanded as time goes by. This is what the past system of further training failed to provide for all teachers. Learning for the teacher examination used to be for many teachers the only form of systematic work on self-improvement.

Documents issued in connection with the educational reform introduce the requirement of further training as a periodic obligation of all teachers. This is justified by several reasons.

(a) The nature of teachers' work is such that they must keep abreast of developments in science, technology, culture, social life, educational theory and practice, teaching techniques, etc. All this cannot be left to personal efforts and individual interests.

(b) Organised further training is particularly important for those teachers who are inadequately qualified or who obtained their qualifications through various shortened or accelerated courses that served to satisfy a social need at the time of intensive educational development.

(c) Further training is also needed for teachers who were trained more than ten years ago, as the concepts of education were much different then from what they are now.

In view of these needs and requirements some of the Republics have already formulated the new system of further training for teachers, while others are preparing legislation on compulsory periodic training schemes for teachers in schools.

5.1.1. Past attempts at further training of teachers

Attention to teachers' further training has been paid since 1945 and various bodies have worked at it: professional groups in schools, teachers' trade unions, educational authorities, social organisations, secondary and post-secondary teacher training schools, faculties, etc. All of them more or less systematically organised occasional lectures, series of talks, conferences, symposia, seminars and courses for teachers. After 1950, seminars and courses for teachers were organised by some social organisations wishing to help teachers in mastering new subjects or whole educational areas just introduced into school curricula as an important factor of modern life. Further training in the field of educational techniques, psychology and didactics was carried out with notable success by pedagogic groups or teams from some secondary teacher training schools, so much so that in some Republics they became the nuclei of pedagogic centres as special institutions.

Such an extensive work on further training of teachers was especially characteristic of the period of preparation for the educational reform. The implementation of the principle of compulsory eight-year elementary education, together with growing requirements with respect to the quality of education offered to the young generation, made it imperative for teachers to improve their knowledge and skills constantly. Despite numerous defects, these early attempts were extremely important because they encouraged and facilitated the introduction of new subject matter and new methods into the teaching process in schools and helped teachers to work themselves on their self-improvement.

When preparations for the educational reform began, special institutions for teachers' further training began to appear. Special pedagogic centres were opened by the Institute for the Promotion of Educational Techniques. The first pedagogic centre for further training was opened in 1956, at about the same time when the Centre for Further Training of Technical and Vocational Teachers was opened too. Very soon centres for further training began to appear throughout the country.

By 1957-58, 35 institutions of further training had been opened in different parts of Yugoslavia.

The General Act on Education of 1958 made provision for special institutions for the promotion of education, such as the Federal Institute for Educational Research, Republican institutes for the promotion of educational techniques, pedagogic service units in districts and Communes. Earlier experiences in teachers' further training, together with the need for this form of training, made it possible at the very beginning of the educational reform to envisage "assistance to teachers in their work and further training" as one of the major tasks of the newly formed institutes for the promotion of educational techniques.

The provisions of the General Act on Education laid the foundations of a comprehensive system of further training. Work in this field then gained in scope and became much better organised in all Republics. 122

Teachers from vocational and technical schools could pursue their further training at the above mentioned Centre for Further Training of Technical and Vocational Teachers, established in 1956 as part of the Institute for the Promotion of Educational Techniques of Croatia. Later the Centre became the Institute for Industrial Education attached to the Vocational Teacher Training College. This Centre provided active assistance in the organisation of seminars for vocational teachers in other Republics. In addition to further training courses in its own premises, the Centre also enabled vocational teachers to obtain further training in their specialised fields at eight experimental technical and vocational schools.

Apart from the work of this Centre, further training of vocational teachers was carried out in some other city and Republican centres of further training.

Parallel with the work on further training of teachers, much was done to improve the organisation of the entire system of further training. The newly formed centres carefully explored the field of their operation, investigated relations between Republican and district centres, established channels of communication and co-operation with all interested bodies and organisations to effect rationalisations in the use of manpower, material resources and time.

These early steps in further training proved highly important in the realisation of the tasks of the educational reform.

5.1.2. Present-day organisation of further training

The most important factors of further training at the present time are Republican Institutes for the Promotion of Educational Techniques and Institutes for the Promotion of Vocational and Technical Education in Croatia, Serbia and Slovenia which have recently established very close ties with associations of schools of a given type, with teacher training schools and faculties, and with other interested bodies and institutions.

Quite apart from these institutes, district and regional institutes of education play a very important role in the further training of elementary school teachers.

Teachers have accepted further training, as a vital need, which is also recognised by schools and the community. It can be said that further training is increasingly becoming an integral part of teachers' professional activity.

Further training does not only serve to brush up the knowledge gained in regular training but also to enrich it with new elements which could not be included in regular training programmes but which are indispensable in the modern school. That is why the forms and contents of further training vary according to the type of school at which the teacher works. Further training of teachers thus becomes a moving spirit for the development of the school itself and of the educational work in it.

Although the General Act on Education of 1958 made the periodic further training of teachers compulsory, not all of the Republics have yet formulated their own legislation in this matter.

We shall now take the example of further training schemes for secondary school teachers in one Republic to illustrate the pattern of organisation of further training in the whole of Yugoslavia.

The main initiator of further training is the Republican Institute for the Promotion of Technical and Vocational Education, which finances most of the schemes itself.

The annual programme includes the following schemes:

1. further training programmes for school headmasters, directors of study and educational consultants;
2. improvement of educational and psychological techniques for all secondary school teachers;
3. further training programmes for headmasters and teachers of adult education institutions;

4. professional and methodological improvement of teachers; this includes:
   a. teachers of general subjects, natural sciences and mathematics;
   b. teachers of theoretical technical subjects and practical skills, according to their specialisations.

Programmes mentioned under item 1. are operated by the staff of the Republican Institute in co-operation with prominent external collaborators.

The programme of improvement of educational and psychological techniques is carried out by the Institute for Industrial Education of the Vocational Teacher Training College. It is meant for all secondary school teachers as the topics dealt with concern educational theory and practice and are of general interest for teachers irrespective of the subjects they teach.

Teachers in adult education industrial training institutions get their further training mostly at Workers' Universities.

Professional and methodological improvement of teachers is done in special training units attached to those secondary schools which are most advanced and progressive. Such schools sign contracts with Institutes for the Promotion of Technical and Vocational Education undertaking to organise this training. In each of them there is a specialist who keeps in touch with the Institute concerned and with the Association for this particular type of schools and he prepares activities envisaged for the training of teachers in the area.

In addition to such further training units, there are also professional teacher centres organised on a regional basis and including all teachers of a given subject from that region. A large proportion of teachers is thus involved in further training and the quality of work is achieved through co-operation with faculties and colleges, professional societies and scientific institutions. The programmes of further training are elaborated jointly by Republican Institutes, further training units, associations of schools, and educational authorities from all parts of the Republic. Programmes of activities are announced one year in advance. Apart from these schemes, local educational authorities organise conferences with their teachers, meetings of teacher groups and seminars.

Special attention is paid to the further training of teachers in the institution in which they are employed. More and more schools initiate their own programmes of further training, including groups for the study of trade periodicals and books, discussion meetings, model lessons, and similar activities. No less important is every teacher's individual work on self-improvement.

Further training schemes exist also for elementary school teachers, organised mainly by pedagogic service units in cities and towns, Communes and districts, and by post-secondary teacher training schools.

Particularly significant for elementary school teachers are professional teacher centres for different subjects and groups of subjects. These centres, organised by Institutes of Education and well equipped, are attached to more progressive elementary schools. Teachers come to them for talks, seminars, discussions and individual consultation work. They are run by educational consultants in methodology from the district or regional Institutes of Education which also finance their activities.

This preparatory organisational work has eased the formulation of legislation that will make teachers' further training and self-improvement compulsory. The compulsory training would be done in two stages: the first stage is meant for all those who enter into the teaching profession for the first time and is supposed to last until they take their professional teacher examination, or roughly up to the third year of their teaching experience; the second stage is meant for teachers who have already taken their professional teacher examination. The attendance of the first stage is prescribed by legislation and that of the second stage by the school's own internal regulations.

The first stage of teachers' further training consists of the following:

(a) Trainee induction period
(b) Preparatory seminar in teaching techniques
(c) Demonstration of practical teaching skills
(d) Advanced seminar in teaching techniques
(e) Professional teacher examination.

(a) The trainee induction period is compulsory for all teachers entering into the teaching profession for the first time. It is meant to acquaint the young teacher, in a direct and rational way, with the educational practice of the school in which he is going to teach. A special programme of induction is prepared to help him to understand the organisational, pedagogic, methodological and technical problems of the school. He will assist at and observe different teaching situation (in the laboratory, classroom, workshop, or in extra-curricular activities). The trainee induction period, organised by the school in co-operation with the pedagogic service unit, lasts two weeks and is usually spent at the school to which the teacher has been appointed or - in case of small and undeveloped schools and technical and vocational schools with peculiar forms of educational activity - at the school chosen by the pedagogic service unit in agreement with the headmaster concerned. The teacher is obliged to complete this induction period before he begins his actual teaching work. During this period, a senior teacher is appointed as his supervisor. He sees to it that the trainee completes the whole programme of induction and that he receives every kind of professional assistance that he might need.

(b) The preparatory seminar in teaching techniques is organised by teacher training institutions for people with different backgrounds (technicians, economists, engineers) who are taking up teaching as a career. As a rule, such people are obliged to complete both the trainee induction period and this preparatory seminar before they can begin to teach.

The preparatory seminar in teaching techniques is to include lectures, discussions, demonstrations, observation of actual teaching work, etc. The participants will also be given reading lists and instructions for independent work.

(c) The demonstration of practical teaching skills is done by the trainee before a special committee of the school in which he is employed. He is supposed to give a certain number of demonstration periods each year until he takes his professional teacher examination. These make it possible to check his progress at regular intervals and to help him in his work as the need arises.

(d) The professional teacher examination is taken before an examination board of a teacher training faculty, college or school. Since this examination should in no way repeat the university finals or any other kind of school examination, it should first of all serve to establish the following:

- how well the programme of further training at the first stage has been mastered by the trainee;
- to what extent the knowledge of the subject of instruction has been applied by the trainee in his teaching work;
- to what extent the trainee has acquired teaching skills and competence in applying basic psychological and pedagogic principles;
- whether he knows the workings of the educational system the objectives and tasks of education, the organisation of the school, etc.), so that he can work actively as a teacher of the young generation.

The professional teacher examination consists of a written paper and an oral examination in his subject of instruction and in pedagogy.

The fulfilment of the programme outlined above requires steady and continuous work of the trainee himself. He must read educational periodicals and books, prepare daily for his periods of teaching, and write annual programmes for the subject that he teaches.

In this way he will be permanently and systematically engaged in problems of teaching and will be able to find his way in the very important formative period of his personal development as a teacher.

The second stage of further training will be provided by teacher training institutions (two-year post-secondary schools, faculties and colleges), in co-operation with pedagogic service units, for experienced teachers in schools to acquaint them with new developments in their own subjects and in the science of teaching. Programmes offered at this stage will be attended by those teachers who have successfully completed the first stage. In addition to information on new developments, they will also receive bibliographical information, hints on independent study and lists of suggested topics for consideration and research. At the suggestion of pedagogic service units and on the basis of their own analyses of staff and teaching requirements, schools will send their teachers to those forms of further training that they regard as necessary.

This form of professional and pedagogic further training of teachers will give schools themselves a greater say in the matter of further training, without neglecting the role of teacher training schools and faculties, professional organisations and other specialised institutions. Once further training becomes regulated by law, funds for this purpose will also be provided more regularly and will enable this important activity to run smoothly to the benefit of the educational system as a whole.

5.2. Use of teaching aids and equipment

The use of teaching aids and equipment has so far been limited by the lack of space and money, but even so a great deal of attention has been paid to the improvement of this important aspect of teaching. Teaching aids are designed and tested by the Yugoslav Institute of School Equipment, as well as by Institutes for the Promotion of Educational Techniques in different Republics. There are also several manufacturers specialised in the production of school furniture, equipment and teaching aids. Given enough money, these manufacturers have sufficient production capacity to equip all elementary and most secondary schools with well-designed furniture and equipment for laboratories of physics and chemistry, collection-rooms, workshops, etc. Most schools already possess basic audio-visual equipment, such as slide projectors, movie film projectors, wireless sets; the number of television sets and tape recorders is also growing rapidly. However, space is lacking for natural science laboratories and collection-rooms and for workshops for technical education. This is largely responsible for the predominance of the verbal approach to teaching and for elements of formalism in pupils' knowledge.

Radio and television in teaching

Radio and television broadcasts for schools are an important factor in the improvement of teaching and are used quite widely in schools because of their wide coverage and quality. Radio broadcasts for schools are given for 45 minutes every morning on all stations in Republican capitals, so that all schools in Yugoslavia can listen to these programmes. Radio stations have given permission to schools to record all programmes on tape free of charge and use them at their convenience.

School radio programmes already have behind them a pretty long tradition. Regular broadcasts began in 1947-48 and at once met with great interest among teachers who used them in their work.

Radio programmes for schools are organisationally linked either with Republican Secretariats for Education and Culture or with radio stations. Programmes are regularly published in advance for the next semester; books with programmes contain also amply illustrated texts to accompany some of the programmes and help the teacher in preparing the lesson.

The greater part of radio and television programmes for schools is based on the curricula of elementary schools and Gymnasia. The importance of the radio in technical education is not yet so great as in general education. The topics dealt with are mostly from literature, history, geography and foreign languages. The theoretical teaching of technical subjects can be much more effective if based on a visual approach, so that much more in this field is expected of the use of film and television.

Television programmes for schools do not date very far back. First educational programmes were broadcast in 1960-61 for 90 minutes a week, 30 minutes of which was taken by films. In the last five years, however, television has greatly expanded its showing time, so that programmes are now shown on five days every week. Every day the programme lasts for 160 minutes: an 80-minute programme is shown in the morning and is repeated again in the afternoon. Programmes are now broadcast from two stations and are carried on a national network.

Surveys have shown that many schools follow these programmes. Television lessons make it easier for teachers to present their subject matter, while the use of model methodological procedures in these programmes improves their work generally.

The most serious problem at present is the fact that Yugoslav television broadcasts on only one channel and that consequently programmes for schools have to compete with regular programmes for showing time.

Movie films and film strips are used to a certain extent too, but they still do not occupy the place in teaching that they deserve. The reason for this is not the shortage of projectors in schools but rather the shortage of suitable films and film strips.

In 1947 a specialised enterprise was established for the production of educational films and film strips. This was the only enterprise in the country that produced mainly such films and it was very well equipped to produce films in black and white and in technicolour. During its life it produced 380 movie films and 1,700 film strips. But as schools at that time were rather short of projectors, films were made in a rather small number of copies and were therefore expensive. The enterprise gradually reduced its production of educational films and stopped it altogether in 1963.

The production of educational films and film strips in the country is now very limited and they are mostly imported. The organisation that is most directly engaged in everything connected with educational films is the Yugoslav Centre for Educational and Cultural Films.

Educational radio and television is also expected to produce educational films and film strips in the future.

The distribution of educational films in schools is done by a specialised institution called "Filmoteka 16" which has a rich film library. Films can be rented for a very small charge, and in some cases the costs are borne by local educational authorities.

School textbooks for elementary and secondary schools are published by specialised publishing firms, of which there is one in each Republic. Various other textbooks and manuals, especially those for technical schools, are published by other firms too (such as "Tehnička knjiga", "Medicinska knjiga", etc.).

Textbooks, satisfactory in both content and presentation, exist for all forms and subjects of elementary school. In addition to textbooks, various other supplementary materials needed in elementary schools are also available (copybooks, follow-up questions and assignments,tests). They are intended to guide the teacher, encourage the pupil to work on his own, and ensure better results in teaching.

The situation with textbooks in secondary schools is not so favourable as in elementary schools. Schools with massive enrolments (such as Gymnasia and secondary schools of economics) have textbooks for most subjects, while other technical and specialist schools lack them mainly because of the great variety of their curricula. Many teachers are therefore forced to resort to dictation or (in the case of schools working in better conditions) to the preparation of mimeographed scripts and handouts for the use of their pupils. The preparation of uniform textbooks for subjects such as general culture, social and natural sciences is sometimes made difficult by unnecessary differences in the programmes of instruction.

The reform of the system of secondary education is expected to make programmes of instruction as uniform as they can be without sacrificing the specific features of different technical and specialist schools. This will certainly result in a better situation with respect to the publication of textbooks for these schools.

In addition to textbooks, newspapers and periodicals for young people are also used in teaching.

Several periodicals are published for elementary school children (such as Radost, Galeb, etc.), carrying contributions by pupils themselves. These periodicals have been found particularly useful as supplementary materials in the lower grades of the elementary school. The main newspaper for secondary school pupils and young workers is the weekly Mladost. Apart from these publications, many elementary and secondary schools publish their own periodicals written and edited by pupils themselves. A great number of pupils subscribe to periodicals published by professional and learned societies (Priroda, Matematičko-fizički glasnik, etc.). These periodicals are also extremely valuable in the teaching of some subjects.

Very important for the professional improvement of teachers themselves are pedagogic journals, such as Pedagogija, Stručno obrazovanje, Pedagoški rad, Problemi stručnog obrazovanja, Revija školstva, Radnik i obrazovanje, and others. These journals are published by the associations of teachers or by Institutes for the Promotion of Education.

In addition to journals, Institutes for the Promotion of Education publish also other materials dealing with topical problems of educational organisation, teaching of individual subjects, new teaching aids, etc. This method of keeping teachers informed and of guiding them is becoming increasingly important and can be expected to become one of the leading forms of work in the improvement of teachers and teaching in the country.

CONCLUSIONS

1. Teachers are the most important and most responsible factor in the implementation and further development of the educational system. They organise teaching and teach themselves, and they appear as intermediaries between the subject matter of education and pupils, exerting an influence through their own personal example. Finally, they also take an active part in the government of the institutions in which they work.

All the three functions listed above make it necessary that something radical should be done in the training and further education of teachers. The education of teachers in the coming period will have to be greatly enriched by pedagogico-methodological, psychological, and ideologico-political knowledge. The whole system of education can be reformed and improved only if well-trained teachers for basic subjects and organisers of teaching are available.

2. The projection of teacher supply and demand foresees that teachers with inadequate qualifications will be eliminated already in the first part of the coming planned period.

A survey of teacher needs and influx of graduates from teacher training institutions shows that this is possible if adequate measures are taken to attract the graduates to the teaching profession.

One of the most important future tasks of working organisations engaged in education directly (like schools) or indirectly (like pedagogic service units and similar institutions) should be the elimination of unqualified people from the teaching process. This can be done in two ways: by in-service training and upgrading and by dismissal of inadequately trained teachers. Younger people and all those who have the interest and ability for teaching should be given an opportunity to obtain additional qualifications at existing teacher training faculties and schools. Others, who are for any reason unable to do this, will have to find jobs in other occupations.

3. It may be assumed that the existing teacher training schools and faculties will be able - from the point of view of their training capacities - to meet teacher needs arising from the projections for the period 1964-65 - 1974-75.

4. Because of the fact that the school network was not rationally developed, teachers' working and living conditions (especially in underdeveloped and rural areas) were often such as to discourage people with higher qualifications from taking teaching positions. Housing difficulties and low salaries were strong negative forces; individual enthusiasm cannot always be relied on to solve the problem of teacher shortage in such areas. It has already been noted that teacher salaries were lower than those of people with comparable qualifications in other branches of the economy. This was particularly notable in elementary schools.

The rationalisation of elementary and secondary school networks and of educational funds would probably uncover certain reserves that could be used for supplying schools with modern equipment and teaching aids which would undoubtedly have a favourable effect on the quality of teaching.

5. Efforts are now being made to put educational finances on a firmer footing. The Federal Assembly has passed the Basic Law on the Financing of Education and individual Republics have already formulated, or are just formulating their own laws to regulate this question. It is hoped that these developments will have a positive effect on the material position of teachers.

As schools become independent and self-governing and as teachers' salaries become related to the quality of their work, so teachers themselves become interested in the improvement of the quality of their work and in obtaining higher qualifications. The proper teaching load is an important prerequisite for the quality of teaching. The load must be such as to result in successful work which will be justly valued and paid. The remuneration for this work must be sufficient to ensure a good standard of living, so that the teacher has no need for additional part-time work. The internal organisation of work in the school also has an effect on the teacher's total load and should be given due attention.

Although hierarchical promotion in the career is excluded from the Yugoslav social system based on self-government and remuneration according to work performed, this does not mean that no promotion is possible. But this "promotion" is done in terms of professional and social recognition gained. It is highly important therefore that the system of further training should be fully developed and that conditions for research in teaching should be created in schools, thus giving promising young people opportunities to earn themselves a reputation while at the same time enriching the practice of teaching. Teachers should therefore be encouraged to study for M.A. and doctoral degrees.

6. In summary, the projections of teacher needs in the coming planned period indicate that serious efforts should be made in the following directions:

- to revise the networks of elementary and secondary schools, so that the services of the most highly qualified teachers could be put to the best use;
- to revise the network of teacher training schools (secondary and two-year post-secondary teacher training schools);
- to improve the quality of teaching in teacher training schools and faculties, so that their graduates become better prepared in their special subjects and in teaching techniques;
- to eliminate gradually all inadequately trained teachers - either by supplementary training or by other measures;
- to introduce incentive schemes to attract expert people for technical and specialist training in secondary schools.

Annex I

Note: These tables follow the model questionnaire which was elaborated for this study. Certain tables are not available.

A - PRIMARY EDUCATION

LIST OF TABLES

TABLE I Number of full-time teachers employed in Primary education, by qualifications, by sex, for the years 1950, 1955, 1960, 1962 and estimates for 1965, 1970, 1975, 1980.

TABLE II Number of full-time and part-time teachers employed in primary education by qualification, by sex and by age groups for the years 1962/1963.

TABLE III Enrolments and population of corresponding age in primary education for the year 1956, 1961, 1963 and estimates for 1966, 1970, 1975.

TABLE IV Number of full-time teachers entering the teaching profession at primary level by qualifications, by sex, for the period 1966 to 1975.

I - Lower primary level

II - Upper primary level

TABLE V Number of new entrants, enrolments and graduates of teacher training institutions, from 1950 to 1965 and estimates for the period 1966 to 1975.

TABLE VI(a) Number of full-time teachers leaving the teaching profession at primary level, by qualification, by sex, for the period 1951 to 1062 and estimates for the period 1963 to 1970.
(This table is not available)

VI(b) Number of part-time teachers ...
(This table is not available)

TABLE I

Number of full-time (1) teachers employed in Primary Education (Public), by qualifications, by sex, for the years 1950, 1955, 1960, 1962 (or latest year), and estimates for 1965, 1970, 1975, 1980 (or nearest year)

	Past					Estimates for the future			
	1950	1954/55	1959/60	1962/63		1965/66	1969/70	1974/75	1980
	MF	MF	MF	MF	F	MF	MF	MF	MFF
I - Number of teachers at Lower Primary level:						54,803	54,431	53,970	
thereof (1) Qualified teachers						53,713	53,889	53,970	
(2) Non qualified teachers						1,090	542	0	
II - Number of teachers at Upper Primary level:						57,937	54,563	54,095	
thereof (1) Qualified teachers						40,289	44,824	54,095	
(2) Non qualified teachers						17,648	9,739	0	
III- Total number of teachers in Primary level (I+II) (2)						112,740	108,994	108,065	
thereof (1) Qualified teachers						94,002	98,713	108,065	
(a) Third level university graduates			4,012	5,053	3,307				
(b) Third level non university graduates			11,324	15,782	8,309				
(c) Second level			55,332	57,241	36,455				
(2) Non qualified teachers				12,201	5,193	18,738	10,281	0	

Note: (1) Apart from the full-time teachers, there were 1,474 part-time teachers in 1959/1960 and 1,277 in 1962/1963.

(2) Among qualified teachers for 1959/60 and 1962/63 there are a considerable number unqualified ones that could not be singled out and listed separately.

TABLE II

Number of full-time and part-time teachers employed in Primary Education (Public), by sex and by age-groups for the year 1962/1963

	Under 24 years of age		25 - 29		30 - 34		35 - 44		45 - 54		55 and over		unknown		Total	
	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F
Total number of full-time teachers in Primary level	15,760	10,501	27,348	16,809	21,210	11,231	15,946	8,876	7,261	4,822	2,595	941	168	83	90,288	53,263
Total number of part-time teachers in Primary level	165	93	207	82	130	30	103	34	75	41	135	53	2	-	817	333

TABLE III

Enrolments(1) and population of corresponding age in Primary Education (Public) for the years 1956, 1961, 1963 and estimates for 1966, 1970, 1975

Level and type of education / enrolments / population — Years	PUBLIC					
	I		II		III = I + II	
	Lower Primary		Upper Primary		Primary Level	
	Enrolments	Population 7-10	Enrolments	Population 11-14	Enrolments	Population 7-14
Past						
1955/56(1)	1,443,227	...	593,143	...	2,036,370	...
1960/61	1,707,574	1,573,321	1,060,227	1,352,124	2,767,801	2,925,445
1962/63	1,720,473	1,622,235	1,270,682	1,507,867	2,991,155	3,130,102
Estimates for the future						
1965/66	1,668,129	1,542,108	1,348,855	1,576,809	3,016,984	3,118,917
1969/70	1,718,222	1,530,389	1,372,510	1,537,297	3,090,732	3,067,686
1974/75	1,750,223	1,527,538	1,524,616	1,527,892	3,274,839	3,055,430

Note: (1) At the end of the school year.

TABLE IV

Number of full-time teachers entering the teaching profession at Primary Level (Public), by origin, for the period 1965/1966 - 1969/1970 and 1970/1971 - 1974/1975

	1965/1966 - 1969/1970	1970/1971 - 1974/1975
	MF	MF
I - Lower primary level		
Directly from teacher training institutions		
thereof		
(a) Third level university graduates..................	0	0
(b) Third level non-university graduates..................	1,563	8,176
(c) Second level graduates	11,868	0
II- Upper primary level		
Directly from teacher training institutions		
thereof		
(a) Third level university graduates..................	0	0
(b) Third level non-university graduates..................	22,755	15,922
(c) Second level graduates	0	0
III- Total number of entrants		
thereof		
(a) Third level university graduates		
(b) Third level non-university graduates		
(c) Second level graduates		

TABLE V

Number of new entrants, enrolments and graduates of public teacher institutions, type of training received by sex, for 1950, 1955, 1960, 1962 (or latest year) and estimates for the period 1963 to 1970 (possibly until 1980)

	Past						Estimates for the future										
	1950	1955/56	1960/61	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75	1975
	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
Regular training programme																	
1. New entrants		4.890	7,255	8,869	7,274	6,614											
2. Enrolments		20,499	28,241	32,564	29,720	29,042	27,496	25,494	23,299	21,232	21,550	20,311	20,253	20,336	21,374	22,414	
3. Graduates		4,335	4,484	4,946			4,619	4,994	4,704	4,106	4,478	4,087	4,033	3,675	3,514	3,696	

B - GENERAL SECONDARY EDUCATION

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TABLE	VII	Distribution of full-time teachers employed in general secondary education by qualification and by broad categories of teaching subjects for the years 1960 and 1963 and estimates for 1966, 1970, 1975.
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TABLE VII

Distribution of full-time(3) teachers employed in General Secondary Education (Public)(1), by qualifications, by sex and by broad categories of teaching subjects, for the years 1960 and 1963 and estimates for 1966, 1970, 1975.

	Past									Estimates for the future											
	1959/1960(2)				1962/1963					1965/1966				1969/1970				1974/1975			
	Science	Humanities	Others	Total	Science	Humanities	Others	Total		Science	Humanities	Others	Total	Science	Humanities	Others	Total	Science	Humanities	Others	Total
	MF	MF	MF	MF	MF	MF	MF	MF	F	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
Number of teachers in long courses				6,110				6,587	3,043	3,091	4,819	2,966	10,876	3,227	4,980	3,261	11,468	3,345	5,120	3,684	12,149
thereof																					
1. qualified teachers																					
(a) Third level university graduates				4,683				4,590	2,487	2,487	4,412	2,147	9,046	2,897	4,758	2,804	10,459	3,345	5,120	3,664	12,129
(b) Third level non-university graduates				0				34	15	0	0	7	7	0	0	7	7	0	0	10	10
(c) Second level graduates				286				207	83			6	6			7	7			10	10
(d) Others				0				0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Non qualified teachers				1,141				1,756	458	604	407	806	1,817	330	2,221	443	995	0	0	0	0

NOTE: (1) The above data refer only to Gymnasia, teacher training schools and arts schools.

(2) Among qualified teachers for 1959/1960 there are also some unqualified ones that could not be singled out and listed separately.

(3) In 1959/1960 the total number of part-time teachers was 1,329 and in 1962/1963: 1,937

TABLE VIII

Number of full-time and part-time teachers employed in General Secretary Education (Public), by sex and by age-groups, for the year 1962/1963

	under 24 years		25-29		30-34		35-44		45-54		55 and over		unknown		Total	
	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F
Full-time teachers:	242	150	1,575	798	1,857	804	2,039	897	1,350	808	625	222	7	3	7,695	3,682
Part-time "	57	24	165	44	189	19	174	31	116	21	120	35	9	-	830	174

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TABLE IX

Enrolments and population of corresponding age in General Secondary Education(1) (Public) for the years 1956, 1961, 1963 and estimates for 1966, 1970, 1975

	Enrolments	Population 15-18
Past		
1955/1956	112,409	-
1960/1961	114,940	1,103,326
1962/1963	158,539	1,131,172
Estimates for the future		
1965/1966	217,467	1,461,010
1969/1970	226,561	1,571,670
	235,211	1,492,666

Note: (1) The data refer only to Gymnasia, Teacher training schools and secondary Arts schools

TABLE X

Number of full-time teachers entering the profession at general secondary level (public) by broad categories of teaching subjects for the period 1966 - 1975

Estimates for the future							
1966 - 1970				1971 - 1975			
Science	Humanities	Others	Total	Science	Humanities	Others	Total
MF	MF	MF	MF	MF	MF	MF	MF
1,624	1,481	1,943	5,048	885	1,039	1,325	3,249

TABLE: XI

Number of new entrants enrolments and graduates at the third level(1) (public) by broad categories of teaching subjects from 1952 to 1960 and estimates for 1966 and 1970

	First year enrolment	Total enrolment		Graduates
		of which part-time	Total	
1952				
I. Faculties				
Arts and letters				
Total humanities				
Natural sciences and mathematics				
Total sciences				
Total:	11,847	6,127	46,715	5,316
II. Other higher Education				
Arts academies	367	58	1,179	128
Colleges	40	512	1,259	97
Two-year post secondary	3,245	2,175	5,947	1,269
Total:	3,652	2,745	8,385	1,494
1956				
I. Faculties				
Arts and letters				
Total humanities				
Natural sciences and mathematics				
Total Sciences	23,454	8,961	60,559	6,328
Total				
II. Other higher Education				
Arts Academies	338	70	1,253	167
Colleges	75	17	233	42
Two year post secondary	4,505	2,491	7,605	1,749
Total	4,918	2,578	9,091	1,958
1960				
I. Faculties				
Arts and letters				
Total humanities			40,547	
Natural Sciences and mathematics				
Total Sciences			42,380	
Total	34,580	8,961	82,927	9,974
II. Other higher Education				
Arts Academies	400	19	1,412	231
Colleges	634	82	1,161	43
Two year post secondary	12,782	7,254	19,286	4,680
Total	13,316	7,355	21,859	4,954

Source: (1) 1952, 1956 or 1960: Mediterranean regional Project: Yugoslavia
(2) 1966, 1970: The development of education in Yugoslavia in the period 1966-70 and its adaptation to the needs of the economy and society. (Note by the Secretariat) Statistical tables (DAS/MRP/66.2 Appendix)

Note: (1) in the two years post secondary is included the upper primary teacher training and vocational teacher training; in the colleges, is included the physical education teacher training.

TABLE: XI (Continued)

	First year enrolment	Total enrolment		Graduates
1966		of which part-time	Total	
I. Faculties				
Arts and letters	4,172		9,856	1,989
Total humanities	11,399		27,607	5,756
Natural Sciences and Mathematics	4,040		7,423	831
Total Sciences	21,450		55,797	8,922
Total	32,849		83,404	14,678
II. Other higher Education				
Art Academies	657		1,980	232
Colleges	2,135		3,960	873
Two years post Secondary	19,107		27,141	9,588
Total	21,899		33,081	10,693
1970				
I. Faculties				
Arts and letters	4,788		12,301	2,164
Total Humanities	12,091		30,983	6,733
Natural Sciences and Mathematics	5,204		8,331	1,478
Total Sciences	24,491		62,623	12,638
Total	36,977		93,606	19,371
II. Other higher Education				
Arts Academies	780		2,351	375
Colleges	3,954		7,466	1,964
Two years post Secondary	23,458		34,845	15,302
Total	28,192		44,662	17,641

C - VOCATIONAL AND TECHNICAL EDUCATION AT SECONDARY LEVEL

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(This table is not available)

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(This table is not available)

(b) Number of part-time teachers ...
(This table is not available)

TABLE XIII

Number of full-time teachers employed in Vocational and Technical Education at Secondary Level (Public) by qualifications, by broad categories of teaching subjects for the years 1960, 1963 and estimates for 1966, 1970, 1975

		Past												Estimates for the future					
		1959/1960(A)						1962/1963						1965/1966					
		Science	Humanities	Technical theory	Practical instruction	Others	Total	Science	Humanities	Technical theory	Practical instruction	Others	Total	Science	Humanities	Technical theory	Practical instruction	Others	Total
		MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
I - Teachers of short courses	(1)						5,222							1,418	1,310	3,100	1,772	966	8,566
Thereof																			
1. **Qualified teachers**	(2)						4,526							680	662	2,227	1,232	786	5,587
(a) Third level university gr.	(3)						777							680	662	1,114	-	786	3,242
(b) Third level non-university graduates	(4)						987							-	-	1,113	616	-	1,729
(c) Second level graduates	(5)						2,762							-	-	-	616	-	616
(d) Others	(6)						-							-	-	-	-		-
2. **Non qualified teachers**	(7)						696							738	648	873	540	180	2,979
II- Teachers of long courses	(8)						4,321							1,627	2,383	3,954	628	1,144	9,736
Thereof																			
1. Qualified teachers	(9)						4,296							1,213	2,185	3,405	448	1,054	8,305
(a) Third level university gr.	(10)						2,922							1,213	2,185	3,405	-	1,054	7,857
(b) Third level non university graduates	(11)						462							-	-	-	224	-	224
(c) Second level graduates	(12)						912							-	-	-	224	-	224
(d) Others	(13)						-							-	-	-	-	-	-
2. Non qualified teachers	(14)						25							414	198	549	180	90	1,431
If a breakdown by I and II is not available:																			
III- Total number of teachers in vocational and technical education	(15)												12,711						
Thereof																			
1. Qualified teachers													8,533						
(a) Third level university gr.													5,441						
(b) Third level non-university graduates													410						
(c) Second level graduates													2,682						
(d) Others													-						
2. Non qualified teachers													4,178						

Note: I: Schools for skilled workers
II: Technical and other trade schools serving the needs of the economy and public services

(A) Among qualified teachers for 1959/60 and 1962/63 there are also some unqualified ones that could not be singled out and listed separately.

TABLE XIII (Continued)

	Estimates for the future											
	1969/1970						1974/1975					
	Science	Humanities	Technical theory	Practical instruction	Others	Total	Science	Humanities	Technical theory	Practical instruction	Others	Total
	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
(1)	1,730	1,562	3,650	2,065	1,137	10,144	2,147	1,937	4,521	2,555	1,395	12,555
(2)	1,320	1,202	3,165	1,765	1,037	8,489	2,147	1,937	4,521	2,555	1,395	12,555
(3)	1,320	1,202	1,583	-	1,037	5,142	2,147	1,937	2,261	-	1,395	7,740
(4)	-	-	1,582	883	-	2,465	-	-	2,260	1,278	-	3,538
(5)	-	-	-	882	-	882	-	-	-	1,277	-	1,277
(6)	-	-	-	-	-	-	-	-	-	-	-	-
(7)	410	360	485	300	100	1,655	0	0	0	0	0	0
(8)	2,054	3,059	5,271	825	1,480	12,689	3,069	4,525	7,737	1,200	2,177	18,708
(9)	1,824	2,949	4,966	725	1,430	11,894	3,069	4,525	7,737	1,200	2,177	18,708
(10)	1,824	2,949	4,966	-	1,430	11,169	3,069	4,525	7,737	-	2,177	17,508
(11)	-	-	-	363	-	363	-	-	-	600	-	600
(12)	-	-	-	362	-	362	-	-	-	600	-	600
(13)	-	-	-	-	-	-	-	-	-	-	-	-
(14)	230	110	305	100	50	795	0	0	0	0	0	0

TABLE XIV

Number of full-time and part-time teachers employed in Vocational and Technical Education at Secondary Level (Public) by sex and by age-groups for the year 1962/1963

	under 24 years		25 - 29		30 - 34		35 - 44		45 - 54		55 and over		unknown		Total	
	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F	MF	F
I - Total number of full-time teachers in vocational and technical education	439	251	2,364	1,055	3,262	1,095	3,268	1,135	2,107	585	935	182	13	5	12,388	4,308
II- Total number of part-time teachers in vocational and technical education	190	66	958	214	1,456	203	1,674	225	591	79	445	49	14	2	5,328	838

TABLE XV

Enrolments and population of relevant age in Vocational and Technical Education at Secondary Level (Public)(1) for the years 1956, 1961, 1963 and estimates for 1966, 1970, 1975

	Public		
	Long courses(1)		Short courses(2)
	Enrolments	Population of relevant age 15–18	Enrolments(3)
	full-time		full-time
Past			
1955/1956	41,942		110,967
1960/1961	109,501	1,103,326	139,305
1962/1963	139,900	1,131,172	138,713
Estimates for the future			
1965/1966	210,433	1,461,010	189,973
1969/1970	266,551	1,571,670	223,642
1974/1975	383,051	1,492,666	276,717

Note: (1) Long courses - Technical secondary schools
(2) Short courses - Schools for skilled workers
(3) At the end of school years.

TABLE XVI

(a) Number of full-time teachers entering the teaching profession in Vocational and Technical Education at Secondary level (Public) by origin, by qualifications, by broad categories of teaching subjects for the period 1966-1975 - Teachers of short courses

	Estimates for the future											
	1966 - 1970						1971 - 1975					
	Science	Humanities	Technical theory	Practical instruction	Others	Total	Science	Humanities	Technical theory	Practical Instruction	Others	Total
	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
Entrants	1,251	884	3,286	1,472	1,061	7,954	1,110	1,042	2,118	1,130	544	5,944
1. Directly from teacher training institutions	1,251	884	-	-	625	2,760	1,110	1,042	-	-	374	2,526
thereof (a) Third level university gr.	1,251	884	-	-	625	2,760	1,110	1,042	-	-	374	2,526
(b) Third level non-university graduates	-	-	-	-	-	-	-	-	-	-	-	-
(c) Second level graduates	-	-	-	-	-	-	-	-	-	-	-	-
2. From other levels of education	-	-	3,286	1,472	436	5,194	-	-	2,118	1,130	170	3,418
thereof 1. Qualified teachers	-	-	3,286	1,472	436	5,194	-	-	2,118	1,130	170	3,418
(a) Third level university gr.	-	-	1,643	-	436	2,079	-	-	1,059	-	170	1,229
(b) Third level non-univer.gr.	-	-	1,643	736	-	2,379	-	-	1,059	565	-	1,624
(c) Second level graduates	-	-	-	736	-	736	-	-	-	565	-	565
2. Non qualified teachers	-	-	-	-	-	-	-	-	-	-	-	-

TABLE XVI

(b) **Number** of full-time teachers entering the teaching profession in Vocational and Technical Education at Secondary Level (Public) by origin, by qualifications, by broad categories of teaching subjects, for the period 1965-75 - Teachers of long courses

	Estimates for the future											
	1966 - 1970						1971 - 1975					
	Science	Humanities	Technical theory	Practical instruction	Others	Total	Science	Humanities	Technical theory	Practical instruction	Others	Total
	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF	MF
I. **Entrants**	1,092	1,215	3,317	402	1,037	7,063	1,614	2,083	3,720	622	1,012	9,051
1. Directly from teacher training institutions	1,092	1,215	-	-	625	2,932	1,614	2,083	-	-	580	4,277
thereof (a) Third level university g.	1,092	1,215	-	-	625	2,932	1,614	2,083	-	-	580	4,277
(b) Third level non-university graduates	-	-	-	-	-	-	-	-	-	-	-	-
(c) Second level graduates	-	-	-	-	-	-	-	-	-	-	-	-
2. From other levels of education	-	-	3,317	402	412	4,131	-	-	3,720	622	432	4,774
thereof 1. qualified teachers	-	-	3,317	402	412	4,131	-	-	3,720	622	432	4,774
(a) Third level university g.	-	-	3,317	-	412	3,729	-	-	3,720	-	432	4,152
(b) Third level non-univer.g.	-	-	-	201	-	201	-	-	-	311	-	311
(c) Second level graduates	-	-	-	201	-	201	-	-	-	311	-	311
2. Non qualified teachers	-	-	-	-	-	-	-	-	-	-	-	-

ANNEX II

GENERAL METHODOLOGICAL REMARKS

ON THE STUDY OF THE SUPPLY AND DEMAND OF TEACHING PERSONNEL IN YUGOSLAVIA FOR PRIMARY AND SECONDARY SCHOOLS FOR THE PERIOD 1965 - 1975

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GENERAL METHODOLOGICAL REMARKS

A. INTRODUCTION

The purpose of this study is to give an estimate of the number of full-time teachers (further on referred to only as teachers) needed in first - and second-level schools in the Socialist Federal Republic of Yugoslavia in the following ten-year period. On the basis of the estimated number of pupils, curricula and optimum number of hours tought (the data supplied by the Department of Vocational Education of the Republic of Croatia) it was possible to estimate the number of teachers needed in every planned year and for various subjects. In addition, it was calculated how many new teachers would be necessary in the two five-year periods (by 1969 and 1974 respectively). We thought that, at the present moment, while work is still being done on the reform of education, any extrapolation could produce a completely erroneous picture of future developments and that is why we avoided it. We made use of it only in exceptional cases. The estimated number of teachers, therefore, is not the number of teachers that will be employed in our schools but the number of teachers that would be necessary for the teaching to function normally.

We shall now explain in general terms the methodology we used. We shall not speak about subsiduary estimates although they may also be important.

The estimates were based on the curricula requirements in the Republics of Croatia, Serbia and Slovenia. Since the curricula for the same type of school are not the same in the three republics and because various branches of the same type of school have different curricula, two different variants of the estimate - the minimum and the maximum were made. According to the maximum variant the estimated number of teachers would be necessary provided all the schools of the type in question accepted such a curriculum which would provide maximum number of teaching periods for all the subjects. (The maximum for each subject was looked for in all the curricula that were at our disposal). The minimum variant was obtained in a similar way. Though the respective minimum and maximum variants have no real significance since it is impossible to accept such extreme plans not only in theory but also in practice, they helped us to obtain the most probable number of teachers needed as the mean of these two variants. We were in a dilemma when choosing the mean as the most probable value. The curricula we were using belonged to the two biggest republics (Croatia and Serbia) and the smallest but the most developed one (Slovenia). Having realized that the standards by which the curricula were to be judged did not depend on the size of the republic whose curriculum was being examined (i. e. they were not quantitative) but on the weight of the

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arguments on which the curriculum in question was based, we made up our minds to choose the mean as the most probable value.

In order to be able to use the teaching curricula we had to estimate the number of classes per form in various types of schools.

We got the number of classes by dividing the number of pupils by the optimum number of pupils in a single class. According to the Department of Vocational Education of Croatia the optimum number of pupils in secondary school classes is considered to be 30, and the Primary education Act prescribes 25 to 35 (we took 30) pupils to a class in mixed-level primary schools and 35 pupils to a class in single-level ones. We went by these standards in all the schools except those in which there was a definite indication that the set standards could not be immediately achieved. In those schools the number of pupils per class was determined by means of exponential interpolation in such a way that the required standard of 30 pupils per class was assumed to be realizable by 1974.

The past trend of this magnitude can be observed in the annexed graphs.

By means of the number of classes and the weekly total of teaching periods required by the curriculum (in fact by our minimum and maximum variants respectively) it was easy to work out the weekly total of periods to be achieved for every subject in every year.

If the weekly total of teaching periods is divided by the standard weekly teaching load per teacher we get the number of teachers needed. Following the opinion of the Department of Vocational Education of Croatia, we took 22 hours a week to be the standard load per teacher, (for practical training 33 hours). It should be mentioned here that the above standard is higher than the one actually practiced at present and this is also one of the reasons why the number of teachers needed according to our estimates is lower than could be expected. In spite of that we did not want to change the standard and considered it to be realizable through more economic school timetables. The only exception was made with primary schools in which, we thought, it was not yet possible to introduce such a time-table. Consequently, two variants for primary schools were worked out.

Although up to now only full-time teachers were spoken about, in the tables representing the estimated required number of teachers there were also introduced part-time teachers but only for technical and theoretical subjects. In those tables the numeral without brackets denotes total number of teachers required, the numeral within brackets below being the percentage of that number represents the number of full-time teachers needed. According to the opinion of the Department of Vocational Education and the results of an enquiry made in some schools in Croatia, it follows that a certain number of periods in the above subjects should be given to part-time teachers.

The tables giving the estimate of the required number of teachers are marked by index 2. In order to estimate the number of new teachers that would be needed in the two five-year planning periods, it was necessary to estimate the number of teachers working in various schools at present with respect to their qualification structure and subjects they teach. In doing that, considerable difficulties were encountered. It was only from the last census of teachers carried out in 1962 that it was possible to learn about the distribution of teachers according to subjects they teach. The missing data were supplied by the Federal Bureau of Statistics.

The estimated distribution of teachers according to subjects they teach was made for 1964 as follows: A_i stands for the number of teachers teaching subject "i" (bulletin no. 343) (From now on index "i" will always stand for the subject "i") F_i stands for the weekly number of hours taught by teachers A_i, s_i stands for the average number of hours taught by teachers A_i, s_i is so small because some teachers were statistically recorded more than once according to the subjects they teach.

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$$F = F_i - F_j$$

$$i \neq j$$

j stands for the subjects which according to our opinion were not statistically recorded more than once. U is the total number of teachers who actually practice teaching (it was obtained by subtracting the number of headmasters and all the teachers that do not engage in teaching from the total number of teachers - the data come from the bulletin no. 356).

U_i is the estimated number of teachers that really taught subject "i" in 1962 and was worked out in the following way:

$$A_j = U_j$$

$$U_p = U - {}_j U_j$$

$$x_i \% U_p = U_i \qquad (i \neq j)$$

$$y\ i\% \ U = U_i$$

B_{64} is the number of teachers in 1964 (bulletin no. 355)

$$x_i \% B_{64} = B_{i\ 64}$$

In the above way the number of teachers teaching subject "i" in 1964 was estimated. Further, $N_{i,\ 62}$ stands for the number of unqualified teachers in 1962, $N_{i,\ 64}$ being worked out in the only possible way:

$$z_i \% A_i = N_{i,\ 62} \qquad\qquad z_i \% B_{i,\ 64} = N_{i,\ 64}$$

All these data with comment referring to particular schools are given in tables with index 1.

In those tables there is also an estimated distribution of teachers according to subjects they teach within school centres. This particular estimate which was made only for some types of schools should not be much relied upon because the data at our disposal were not complete.

It should be pointed out that the estimate of the present situation is very unreliable the reason being not only the incompleteness of data but also the unreliability of those that were at our disposal.

The estimate of the required number of new teachers was based on the results obtained from the tables with index 2 and 1. From the data supplied by the Social Insurance Board it follows that the yearly loss of teachers is 3% (owing to retirement and death). The need for new teachers in the periods from 1964/65 to 1969/70 and 1969/70 to 1974/75 was estimated. The estimate was carried out in the following way:
"x" is the number of untrained teachers who should get supplementary training or be substituted by trained teachers so that by 1974/75 there should be no more untrained teachers. D_{69} and D_{74} stand for the number of new teachers that would be necessary in our schools in the first and second five-year period respectively. The calculation was based on the following facts: the increasing number of pupils, the loss owing to retirement and death and the inhereted shortage of teachers.

T_i stands for the total number of teachers that should enter the teaching profession in the two respective five-year periods. The new teachers will be required because of the larger number of pupils, the inherited shortage of teachers, the loss due to retirement and death and because of the substitution (supplementary training) of the unqualified teachers by the qualified ones.

$$D_{i,69} = 1.062\ (P_{i,69} - 0.859B_{i,64})$$

The coefficients were obtained because of the losses owing to retirement and death. $P_{i,69}$ is the number of teachers required in 1969/70 as recorded in table 2.
(Technical and theoretical subjects are represented by numerals in brackets)

$$D_{i,74} = 1.062\ (P_{i,74} - 0.859P_{i,69})$$

The estimate for the second five-year period was based on the assumption that D_{69} had been achieved, i.e. that all the required new teachers had entered the teaching profession. Further:

$$X = 0.084\ N_{i,64}$$

$$T_i = D_{i,69} + 5x$$

The assessment of the qualification structure of teachers was based on the data and suggestions given by the Department of Vocational Education of Croatia. Those data are annexed as Table XI. However, it should be pointed out here that the estimate of the qualification structure of teachers of technical and theoretical subjects was not carried out for each particular subject separately, but for groups of related subjects.

University or college graduates were considered to be qualified to teach in secondary schools, graduates from secondary teacher training schools and teacher training colleges (or those holding a corresponding higher degree) as being qualified to teach in primary schools. The estimated qualification structure of science teachers (mathematics, physics) is necessarily not quite accurate, because all those that had a degree in sciences had to be considered as trained to teach all the science subjects. The actual number of teachers that are not trained for particular science subjects they teach is higher than it appears in this study since our calculation was based on the relation between a science degree and the group of science subjects. It is not known (data non-existent) how many science teachers are trained for the particular science subject they actually teach.

The rest of the comment on the tables can be found in sections dealing with particular types of schools.

There is one more thing to be mentioned at the end. It was not possible to give even an approximate estimate of the teachers that would enter the teaching profession if the present trend of graduation were to extrapolate. Although there exist data on the latter problem (they were collected by the Mediterranean Regional Project Bureau) we were not able to use them because the only data registering the percentage of graduate students that take up teaching according to tables 1 - 7 of the Federal Bureau of Statistics are not correct.

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B. TYPES OF SCHOOLS

EIGHT YEAR PRIMARY SCHOOLS

Present situation:

The estimate of the teacher requirements by the subjects they teach and the evaluation of their qualification structure was made for 1964/65 according to the above methodology, assuming that in the bulletin no. 343 combined subject teachers were not statistically recorded more than once (in that bulletin, teachers are recorded as many times as there are subjects they teach).

In primary schools, more than in any other type of school, it is evident that the existing teaching staff is being uneconomically used. The foregoing statement was based on the following: according to the data supplied by the census of teachers, in 1962/63 single subject teachers in primary schools taught on the average only 15.3 hours a week whereas 28.9% of total number of hours was covered by part-time and overtime teaching as well as by those teachers who taught in other than own schools in order to complete their weekly teaching obligations. The average weekly load of full-time teachers is in fact bigger that indicated in the above average (15.3), which does not include either overtime teaching or the teaching done in other than own schools to fulfil weekly teaching obligations. This low average realized within the regular obligations in own schools, the high percentage of part-time and over time teaching and teaching in other than own schools in order to fulfill weekly teaching obligations points out to uneven loading of teachers.

The subjects most frequently taught part-time and overtime are physics (39.5%), mathematics (37%), chemistry (33.7%), biology (32.2%) and foreign languages (37.2%), those least frequently taught part-time and overtime are physical training (19%) and technical education (19.6%).

The fact that science subjects and foreign languages are mostly taught part-time and overtime points out the shortage of teachers for these subjects.

As regards the qualification structure of teachers the situation is worse in the following subjects: technical education (79.6% of the teachers who teach that subject are not properly trained to do so), physical training (61.7%), drawing and painting (59.8%), music (54.1%) science subjects following closely behind: mathematics (43.5%), biology (34.6%), physics (34.5) and finally mother tongue (33.2%).(1)

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(1) This term is used in Yugoslav statistical terminology to cover the languages of the nationalities and minority groups living on the territory of the Socialist Federal Republic of Yugoslavia.

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Forecast:

In order to forecast the teacher requirements in eight year primary schools in the period from 1964/65 to 1974/75 it was necessary to estimate the number of pupils in mixed-level classes for each particular year of that period. That particular estimate was necessary because 1) the standard number of pupils in mixed-level classes is considerably smaller than in the single-level ones and 2) it is in those classes that combined subject teaching takes place.

The estimate was based on the data on the percentage of pupils in mixed-level classes in the period from 1958/59 to 1962/63.

The original data were approximated by the exponential function of the equation:

$$Y = 23.3804 \times 0.92474^x$$

(see the annexed graph) and the percentage of pupils in mixed-level classes for each year of the following period was worked out by extrapolation. Since there are no data as to how many pupils with regards to particular forms are included in mixed-level classes the estimated percentage of the number of pupils in mixed-level classes, obtained by extrapolation of the exponential function, is taken as the number of pupils planned in forms I to VIII.

According to the Primary school Act the optimum number of pupils in single-level classes is 35, in mixed-level ones between 25 and 35. Since in the period from 1958/59 to 1962/63 the average number of pupils per mixed-level class was 31 (generally over 31) the average of 30 pupils per mixed-level class was taken in the calculations for the planning period.

The total number of mixed-level classes (the ratio of the estimated number of pupils in mixed-level classes to 30) and the number of lower-form classes (the ratio of the difference between the planned number of pupils in the forms I to IV and the number of lower-form pupils in mixed-level classes to 35) represents the total planned number of classes with one teacher per class system. Consequently, the number of teachers required in those classes is the same as the number of classes.

The number of pupils in forms V to VIII in single-level classes was divided by 35 resulting in the number of higher-form classes in which single subject teaching is conducted. By examining the above number of classes with respect to the curricula requirements in the republics of Serbia, Croatia and Slovenia it was possible to work out the maximum and the minimum number of periods per subjects. The estimate of the teacher requirements in eight year primary schools was exceptionally worked out in two possible variants. The first variant gives the number of teachers that would be needed in primary schools in the planning period if the teachers taught 22 hours a week (Table I_2) which is the teaching standard. The second variant indicates what the teacher requirements in eight year primary schools would be if teachers taught the average weekly number of hours as shown in Table I_2'' / the foregoing weekly load was obtained by exponential interpolation between the values 15.3 (in 1962/63) and 22 which is supposed to be achieved in 1974/75.

The difference in the teacher requirements by subjects reflecting similarities and dissimilarities of the curricula in the above quoted three republics is relatively small in primary schools compared with other types of schools. The number of periods for history, geography and chemistry is the same in all the three republics. There are small differences in the teaching of mother tongue in Vth form: (5 periods in Slovenia and Croatia, 6 in Serbia), biology in Vth form: (3 periods in Slovenia and Croatia, 2 periods in Serbia), mathematics Vth form: (4 periods in Slovenia, 5 periods in Croatia and Serbia; VIth

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form : (4 periods in Slovenia and Croatia, 5 periods in Serbia), physical training in VIIth and VIIIth forms : (2 periods in Slovenia and Croatia, 3 periods in Serbia), foreign language in VIIth and VIIIth forms (2 periods in Slovenia, 3 periods in Croatia and Serbia). The subjects for which the number of periods varies most in the three republics are domestic science and social sciences (elements of social organization and elements of social behaviour).

The total number of periods in particular forms ranges from 3 to 6 (3 periods in Croatia and Serbia, 6 in Slovenia) for domestic science and from 2 to 7 for the group of social sciences (2 periods in Serbia, 4 in Croatia and 7 in Slovenia).

The number of new teachers that will be needed in primary schools in the periods 1964/65 - 1969/70 - 1974/75 is shown in Tables I_3 and I_3''. According to Table I_3 which is based on the first variant estimate only a relatively small number of new teachers seems to be necessary in the two above periods. Moreover, in the first of the two periods the table shows a surplus of teachers of history, geography and technical training.

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GRAMMAR SCHOOLS (GYMNASIUM)

Present situation:

According to the census of teachers which was carried out in November 1962 there is a shortage of grammar school teachers particularly for some subjects.

The data of the census provide the number of part-time teachers as well as their average teaching load (this includes the number of periods tought by part-time teachers as well as overtime teaching done by full-time staff) with respect to subjects they teach, which makes it possible to find out the number of periods (with respect to subjects tought) which was not realized by full-time teachers within the framework of their regular teaching obligation. This number may serve as an indicator of the shortage of full-time teachers. Whereas a certain number of part-time teachers is not only tolerable but even desirable in secondary technical schools since those teachers help to achieve the necessary close relationship between theory and practice by incorporating new technological developments into education, in grammar schools there is no reason for the employment of part-time teachers except perhaps in a few subjects (classical languages, philosophy) which are allotted a very small number of periods by the curriculum. Therefore this relatively large number of periods tought by part-time teachers can only be explained by the shortage of full-time teaching staff. The only way out of the difficulty was to get full-time teachers to teach overtime and to employ part-time teachers. The data show that from the total number of periods (114001), 24341 periods or 21.3% were tought by part-time teachers (part-time teachers and overtime teaching done by full-time staff). Accordingly, more than a fifth of the total number of periods was not included in the regular teaching obligation of full-time teachers.

If we try to work out how many full-time teachers would have been necessary to teach all the above periods we learn that there should have been 1316 (there were 4858) more teachers employed than there actually were. It follows, therefore, that more than a forth (21.3%) of the required number of full-time teachers (6174) were substituted by part-time teachers and overtime teaching done by full-time teachers. This estimate was obtained as follows: the total number of periods F (89660) tought by full-time teachers was divided by the number of full-time teachers U_o (4858) resulting in the average weekly number of hours tought by those teachers (18.5). The total number of hours tought by part-time teachers (24341) was divided by the average weekly number of hours tought by full-time teachers resulting in the number of full-time teachers that would be necessary to do all the teaching that was so far done by part-time teachers.

This estimate which was made for particular subjects points out a considerable shortage of teachers of mathematics, physics, foreign languages, drawing and painting, music and physical training. That is to say that the number of full-time teachers should have been larger than the existing one: for 41.5% in mathematics, for 38.1% in physics, for 30.5% in foreign languages, for 31.6% in drawing and painting, music and physical training taken together, if part-time teaching was to have been avoided.

The situation was not much better with respect to the qualifications structure of teachers. More than a fifth of the existing full-time teachers (21.4%) were not trained to teach the subjects they taught. As was mentioned before the estimate was based on the relation: "type of faculty or college a teacher graduated from - the subject he teaches", not on the relation: "teacher's speciality - the subject he teaches". If the estimate were based on this latter relation the number of teachers not trained for the subjects they teach would be even larger (e.g. all those having graduaded from the Faculty of Natural Sciences and Mathematics and Faculty of Philosophy were considered to be qualified to teach mathematics, although their special line may be biology, geography or history).

Since the data for the relation: "teacher's speciality - the subject he teaches", do not exist the estimate had to be built upon the former relation which, though incomplete sufficiently underlines the problem of teachers not trained for the subject they teach and the need for its solution.

The subjects of the educational field are in the first place as regards the number of teachers not qualified to teach them (58.1% of full-time teachers were not trained for these subjects) chemistry comes next (39.88%), then biology (21.97%) and mathematics (21.87%).

In the period 1962/63 - 1964/65 the number of pupils went up by 39.6%, the number of classes by 39.2% and the number of full-time teachers by 40.2%. This relatively insignificant increase in teaching staff in comparison to the increase in the number of classes could not make up for the inherited shortage of teaching staff resulting from the additional number of periods given to certain subjects (to mathematics in social-science-and-language branch ; to mother tongue and philosophy in the mathematics-and-physics branch of grammar schools). From the above it follows that in 1964/65 there was still a shortage of teachers. For 1964/65 the estimate of full-time teacher requirements by subjects as well as the evaluation of their qualification structure were made on the analogy of the similar estimate obtained for 1962/63 (Table II_1).

Forecast:

In forecasting the number of teachers that will be needed in grammar schools by 1975, the existing great number of specialized grammar schools presented a considerable obstacle (social science-and-language branch, mathematics and physics branch in Croatia and Serbia, educational grammar schools in Croatia and Slovenia, grammar schools with accent on classical languages in Croatia and general grammar schools in Slovenia). As the number of periods per subject required by the curriculum varies greatly according to the type of school, in order to make an estimate of the number of teachers needed in grammar schools it was necessary to estimate the number of pupils and the number of classes in the special branches of grammar schools.

The distribution of the planned number of pupils among various types of specialized grammar schools was based on the number of pupils in those particular branches in 1964/65 (42.2% of the total number of pupils in that year attended social-science-and-language branch of grammar school, 45.2% mathematics-and-physics branch 5.1% educational grammar schools, 0.6% grammar schools with accent on classical language and 6.9% general grammar schools). The estimate of the number of pupils in specialized types of grammar schools in the coming period was founded upon the data for 1964/65 (the last year for which the data are provided). That was also the first year in which teaching in bifurcated forms was conducted according to the new specialized curricula. In addition, grammar schools of the educational type for the first time had all the four forms. (It is obvious that none of the years of the 1961/62 - 1963/64 period was suitable to serve as a model on which to base the estimate of the distribution of pupils in various specialized grammar schools for the coming period since those were the years in which generations taught according to the old general curricula were followed by the ones that were able to choose special lines of study. The number of pupils in grammar schools of the general type has been decreasing from year on behalf of the specialized grammar schools).

The distributed planned number of classes in specialized types of grammar schools following the distribution in 1964/65 was then analysed with respect to corresponding specialized curricula, resulting in the required number of teachers (Table II_2). The required number of teachers per subject varies because of the existing differences among the republics as regards the number of periods prescribed for the same subject in the same type of grammar school.

From Table II_3 it follows that the number of new teachers needed in the period 1964/65 - 1969/70 is almost twice as large as that in the period 1969/70 - 1974/75. This is the consequence of the inherited shortage of teachers which, it is assumed, could be put into balance by 1969/70. This fact is corroborated by the data in Table II_2 according to which a specially large number of teachers is needed in those subjects which were determined to have been short of teachers in 1962 such as : mathematics, physics, and subjects of the educational field with the exception of music. Accordingly, there will be a surplus of teachers of music in the period 1964/65 - 1969/70 which is the result of changes in the music curriculum. Whereas in the curriculum which was applied both to the social-science-and-language and mathematics-and-physics branches in 1962, a certain number of periods was given to the subject - arts, which included both drawing and painting and music (each participating with 50% in the allotted number of periods) in the changed curriculum for both above mentioned branches of grammar schools the number of periods which had previously been shared by drawing and painting and music was now given to drawing and painting exclusively. Consequently, music is no longer taught in these two types of grammar schools (it is taught only in educational grammar schools) which, logically led to a surplus of teachers of music.

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SECONDARY TECHNICAL SCHOOLS (All types taken together)

Present Situation:

It was not possible to give an assessment of the present situation as regards teaching staff (numerical and qualification structure) in various types of secondary technical schools: mechanical-engineering schools, electrical-engineering, civil engineering technological schools and others. Consequently, the estimate of the required number of new teachers (the balance between the estimated required number of teachers and the existing number in 1964/65; some corrections were necessary because a number teachers was lost owing to retirement and death; in addition, qualification structure of the existing teachers was improved) will not be made for the above quoted types of schools separately but for secondary technical schools taken together.

Planning of the number of pupils in each of the above mentioned branches of technical schools was based on the number of pupils in those particular schools in the past period. However, some redistributions had to be made following the distribution data found in statistical reports. Thus e.g. the pupils of the agricultural - mechanics type of school were listed with pupils of mechanical-engineering schools because mechanical-engineering subjects were considered to be of primary interest, agricultural subjects - of secondary one (this fact is corroborated by a large number of teaching periods given to mechanical-engineering subjects in these schools). On the other hand, these schools were counted among agricultural schools by the Federal Bureau of Statistics. Drilling departments of mining schools were also included among mechanical-engineering schools, whereas they were listed with mining schools in statistical reports. Statistical reports, however, do not supply sufficient information for analogical regroupings to be made with teachers so that the data on the number of teachers in the base year of the planning period (1964/65) cannot be compared with the estimated number of teachers required in various specialized types of technical schools. In estimating the number of teachers needed in various specialized technical schools classification into various specialized types was followed. The internal structure of schools within various types which emerged when the number of pupils was planned had also to be taken into consideration.

By dealing with technical schools taken as a single group in presenting the survey of the present situation and the required number of teachers it was possible to avoid the mistakes which would have inevitably occured if the estimate of the required number of new teachers had been based on the classification into various types of schools, the reason being redistributions of pupils from one type of specialized school to the other. However,

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the mistake caused by including pupils of agricultural-mechanics type of schools among those of mechanical-engineering schools was not avoided.

The estimate of the teacher requirements by subjects in 1964/65 was founded upon 1962 census of teachers which shows how many teaching periods were taught by full-time teachers. The total number of teachers in secondary technical schools in 1962/63 (data supplied by bulletin n° 356) was distributed by subjects in proportion to the number of periods realized in each respective subject. What was distributed was, in fact, the balance between the total number of teachers and the teachers of physical training, health education, hygiene and practical training. Those teachers were believed to be recorded only once in the census data (i.e. teachers of these subjects in second-level schools seldom teach more than one subject). The resulting numerical structure as regards the subjects they teach obtained for 1962 was subsequently applied to the total number of teachers in secondary technical schools (B,'64) that were not included in school centres in 1964/65. The estimated number of technical school teachers (C) within the framework of school centres was also based on the above structure.

The sum of B'i, 64 + Ci yielded the final estimate of the required number of teachers of subject "i" in 1964/65. For 1964/65 the estimate of the number of teachers not qualified to teach particular subjects was based on the percentage of untrained teachers in 1962 (data supplied by the census). There was a high percentage of untrained teachers of physical training, hygiene, practical training, technical and theoretical subjects, physics and mathematics.

Forecast:

From table III$_2$, (resulting from the combined data of tables III A$_2$ and III E$_2$) which shows the estimated required number of technical school teachers with respect to subjects and years of the planning period it is evident that greatest variations (percentually) in the number of teacher requirements appear first of all in those subjects which are allotted a small number of periods by the curricula (hygiene, geography, social sciences, economics, business management, history). The number of teachers needed for hygiene and geography deviates for 100% from the average, which follows logically from the wide range of periods given to these subjects in the three respective republics. The number of periods ranges from 0, i.e. the subjects are not taught at all to a definite of periods which varies in particular types of specialized schools.

There is a very big difference in the required number of practical training teachers (68.5% deviation from the average). This subject is not taught in the schools of the same type in all the three republics whose curricula were at our disposal; e.g. practical training is not taught in mechanical-engineering and electrical-engineering schools in Slovenia, in civil-engineering schools in Croatia, whereas it is allotted a relatively large number of periods in the republics where it is taught. The big difference between the maximum and the minimum number of teachers of this subject is the consequence of variations in the curricula requirements in the three republics.

Variations in the required number of teachers needed and conditions which caused them will be treated more thoroughly in sections on particular types of specialized technical schools.

From table III$_3$ it follows that in the period 1964/65 - 1969/70 there will be a surplus of teachers of chemistry and social sciences. These data, however, are not quite reliable since, they could have originated in the inaccurate classification of chemistry either among theoretical subjects or among natural sciences. Similarly in the case of social sciences the reason could have been unreliable data on the existing number of teachers of this subject.

Mechanical-Engineering Schools

Forecast:

The estimate of the number of teachers needed in this type of school was based on the curricula requirements in the republics of Slovenia, Croatia and Serbia. In estimating the number of pupils in these schools, the following types and subtypes of technical schools were treated together : all departments of mechanical-engineering schools, marine-engineering, agricultural-mechanics, mechanical-transport-engineering, electrical engineering (mechanical-engineering branch) and drilling-mechanics department of mining schools. However, only mechanical-engineering school curricula were at our disposal (including the curriculum for mining departments of mechanical engineering schools).

In order to work out the estimate it was necessary first of all to assess the number of pupils in drilling departments of mining schools and mining departments of mechanical-engineering schools. Further, it was necessary to examine the resulting number of pupils and classes respectively (0.7% of the total number of classes) with respect to the curriculum for mining departments of mechanical-engineering schools (for Croatia and Serbia).

The remaining classes were analysed with respect to mechanical-engineering school curricula (excluding the curriculum for mining departments) of the above mentioned three republics. Fundamental differences in the number of periods prescribed by the curricula for mining and other departments of mechanical-engineering schools respectively are manifestly expressed in the main subjects of the respective departments (the group of mechanical-engineering and mining-engineering subjects respectively).

Table III A_2 shows that there are greatest variations as to the required number of teachers in those subjects which are allotted the smallest number of periods by the curricula. Moreover, in some republics, those subjects are not at all included in the curricula of this type of school (geography in Serbia, economics and business managemen in Slovenia). The number of teachers of practical training varies considerably, this subject being differently treated in particular republics (e.g. it does not exist in the curriculum for mechanical-engineering schools in Serbia). Accordingly, the number of periods allotted to this subject by the mechanical-engineering school curricula in the three republics ranges from :

0 - 4 periods in Ist form, 0 - 6 periods in IInd form, 0 - 6 periods in IIIrd form and
0 - 9 periods in IV form.

Electrical-Engineering Schools

Forecast:

The estimate of the number of teachers needed in this type of school was based on the electrical-engineering school curricula requirements (department of power current and low-tension current) in the republics of Croatia, Serbia and Slovenia respectively.

The number of required teachers varies considerably in subjects with a small number of periods. These subjects are of minor importance because they are either not taught at all in some republics (e.g. economics and business management in Slovenia, political and social organization of Yugoslavia in Serbia and geography in Croatia) or, if taught, they are represented in the curricula with a very small number of periods. The situation is similar with respect to teachers of practical training, technical and theoretical subjects.

The treatment of practical training in this type of school varies considerably from republic to republic: it is not taught at all in electrical-engineering schools in Slovenia, it is allotted a rather small number of periods in Serbia, whereas in Croatia the number of periods prescribed for this subject is relatively large (in the department of power current it is 3 times as large as the number of periods in Serbia, in the department of low tension current it is 2.5 times as large). Consequently, the number of teachers required for this subject ranges from 0 - 51 (in 1965/66) depending on whether Slovenian or Croatian curriculum requirements are generally accepted in the coming period.

Civil-Engineering Schools

Forecast:

The estimate of the number of teachers needed in this type of school was based on civil-engineering school curricula requirements in the republics of Slovenia, Croatia and Serbia respectively. Teacher requirements for the following subjects vary a gret deal from republic to republic: geography, political and social organization of Yugoslavia, hygiene and practical training.

The first three subjects are characterized by a small number of periods as required by the curricula (only 2 periods in IVth form in Slovenia and Croatia for political and social organization of Yugoslavia, wheras this subject is not taught in Serbia, 2 periods in Ist and IInd forms in Slovenia and Croatia for geography - not taught in Serbia, 1 period in one of the four forms (indiscriminately) in Slovenia and Croatia for hygiene - not taught in Serbia).

Practical training is, however, allotted a larger number of periods: (4 periods in each of the first three forms in Slovenia, 4, 2-4, 2-3 periods respectively in the first three forms in Serbia; the ranges 2-4 and 2-3 result from the differences in the number of periods in IInd and IIIrd forms prescribed for various departments of civil-engineering schools).

In Croatia, however, this subject is not comprised in the civil-engineering school curriculum. The big difference between the maximum and the minimum number of teachers required for the above subjects, therefore reflects differences of the curricula in the three republics.

The situation is analogous where foreign language teaching is concerned. A foreign language is given 2 periods in each of the 2 last forms in all the three republics, whereas in the first two forms there are considerable variations: 2.2 periods respectively in Serbia, 2-3, 2 in Croatia, 4.5 on Slovenia.

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Technological Schools

Forecast:

The estimate of the number of teachers required to teach subjects in each year of the planning period relied solely in the curriculum requirements for the chemical-technological school in Serbia. The two departments (production-engineering and analytical) diverge as regards the number of periods available for the following subjects : economics, business management, technical and theoretical group (chemistry, mechanical-engineering, electrical-engineering - power current) and practical training, which is necessarily reflected upon the number of teachers estimated as needed to teach these subjects.

The number of teachers needed for practical training varies most conspicuously. The number of periods available for this subject by the curriculum ranges from:
2 periods in Ist form, 0 - 6 in IInd and 0 - 6 periods per week in IIIrd form.

OTHER SECONDARY TECHNICAL SCHOOLS

Forecast:

Other secondary technical schools comprise: mining, textile, footwear and rubber manufacturing schools, wood and timber manufacturing schools, chemical, metallurgical, transport, shipbuilding, schools for food technology, hydrometeorological and geological schools. The curricula for only five of the above quoted schools were at our disposal. They were as follows:

Mining school curricula - in Croatia and Serbia
Textile school " " " " "
Footwear and rubber manufacturing school curricula - in Croatia
Wood and timber manufacturing schools curricula - in Slovenia, Croatia and Serbia
Chemical school curricula - in Slovenia and Croatia

The required number of teachers (expressed percentually because absolute numbers are too small) varies particularly for those subjects (geography, political and social organization of Yugoslavia, economics, business management, hygiene) which are allotted a small number of periods by the curricula (if taught at all). The number of periods usually ranges from 0 - 1, and 0 - 2, which leads to a 100% deviation from the average. As regards the subjects with a large number of periods available there are greatest variations as to teacher requirements in the subjects: practical training and technical and theoretical subjects. The number of periods available for these subjects varies greatly not only from republic to republic, but even within the same republic with regard to the type of school (thus e.g. the number of periods for practical training in textile schools ranges in particular forms from: 5 - 14, 8 - 18, 0 - 12, 0 - 14 periods a week).

Agricultural, Forestry and Veterinary Schools

Present situation:

In the bulletin no. 343 (data provided by the census of teachers carried out in November 1962) teachers are registered according to the subjects they teach but they are listed as many times as there are subjects they teach. It was assumed, however, that teachers of physical training, health education, hygiene and practical training never (or very seldom) teach any other subject. Therefore the number of teachers as recorded in the bulletin no. 343 can be considered to correspond to the actual number of teachers of these subjects.

The number of teachers of remaining subjects recorded in the above mentioned bulletin was found out by distributing the actual total number of teachers in the above schools (bulletin no. 356) among the remaining subjects in proportion to the number of periods they are represented with in the teaching load of these teachers.

The total number of teachers in 1964/65 was based on the percentage of the number of teachers of particular subjects in 1962/63, thus yielding the distribution of teachers by subjects in the base year of the planning period. Similarly the qualification structure of the teachers in 1964/65 was based on the same structure in 1962/63. It is necessary to point out here that the census data concerning the above schools were very unreliable but that fact will be dealt with later.

Forecast:

The estimate of the number of teachers needed in this type of school was based on the agricultural school curricula requirements in Slovenia and Serbia and forestry school curricula requirements in Slovenia and Croatia. It was not possible to make an estimate of the number of teachers needed in veterinary schools because their curricula were not at our disposal (pupils of veterinary schools represent only 1.2% of the total number of pupils in the group of agricultural, forestry and veterinary schools).

Accordingly, Table IV_2 indicates the number of teachers required in agricultural and forestry schools.

The planned total number of classes (ratio of the planned number of pupils to number 30, which is the optimum average number of pupils per class) is divided into agricultural school classes (88.5% of the total number of classes) and forestry school classes (10.3% of the total number of classes). The estimated number of classes in agricultural and forestry schools obtained in the above way was subsequently analysed from the point of view of the curricula requirements in these types of schools.

The number of periods available for the same subject in different republics varies quite considerably in these types of schools. Moreover, they vary within the same republic when different subtypes of schools are considered. The variations result in the big intervals between the maximum and the minimum number of teachers estimated to be required to teach the subjects under consideration.

For technical and theoretical subjects there is, relatively and absolutely, quite a large difference as to how many teachers should be considered necessary which once again reflects the wide range of periods given to these subjects by various curricula (e.g. in agricultural schools the number of periods prescribed for the subjects in the group - agriculture ranges in forms I - IV from:
0 - 4, 5 - 10, 6 - 20, 8 - 18 ; mechanical engineering in forestry schools from:
2 - 3, 0, 0 - 3, 0 - 3.

Table IV_3 which gives the estimate of the required number of new teachers for the two following five-year periods shows in the minimum variant, a surplus of teachers in 9 out of 14 subjects. This is partly the consequence of the impossibility of comparing the data on the number of teachers in 1964/65 (this number was supplied by the 1962 census of teachers data according to which agricultural - mechanics type of schools were included in the group of agricultural, forestry and veterinary schools) with the estimated number of teachers required in the planning period (the estimate of the required number of teachers was based on the planned number of pupils, which did not include pupils of agricultural - mechanics branch - they were comprised in the group of mechanical - engineering schools).

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On the other hand, the above mentioned surplus of teachers is partly due to the fact that veterinary school teachers were not taken into account when the estimate of the teachers required in this group of schools was being made. In addition, the census data on the number of teachers per subject in these schools were unreliable (e.g. in forestry schools teachers of forestry and wood technology were not listed, which caused a relatively large number of new teachers of technical and special theoretical subjects to be considered as necessary in these schools in the period 1964/65 - 1969/70).

There is one more fact which points at the unreliability of the 1962 census as far as this group of schools is concerned; namely if the total number of periods taught by full-time teachers in these schools (bulletin no. 343) is divided by the number of teachers (full-time) in these schools (bulletin no. 356) it follows that full-time teachers in these schools taught only 10.2 hours a week on the average, which is very unlikely.

SECONDARY BUSINESS SCHOOLS, ADMINISTRATIVE AND SECRETARIAL SCHOOLS

Present situation:

For these types of schools there do not exist reliable data on the distribution of teachers with respect to subjects they teach, so that the estimate of the present situation (1964/65) had to be based on different principles from those used when dealing with other types of schools. First of all the estimate of the required teachers by subjects was made for each year of the planning period. This numerical structure of teachers by subjects in 1965/66 was then applied to the already known total number of full-time teachers in 1964/65. The distribution of teachers by subjects was based on the number of periods available for particular subjects, so that the resulting distribution reflected the situation as it should have been (limited to a certain extent by the total number of teachers), not as it actually was in 1964/65. Consequently, it is not possible to speak about the shortage of teachers of certain subjects but it is possible, however, to say that the number of teachers in 1964/65 was not sufficient. We were led to the above statement by the fact that the number of teachers per class is 1.37 in all the years of the planning period, whereas it was only 1.32 in 1964/65. In spite of the fact that such an estimate makes it impossible to say anything definite either about the numerical structure of the teaching staff (a possible shortage of teachers for particular subjects) or about their qualification structure. However, such a rough estimate had necessarily to be made if the required number of new teachers (per subject) was to be estimated for the planning period. Thus it becomes possible to sum up the required number of teachers per subject in particular types of schools, which, in turn, renders it possible to determine the contingent of teachers of a particular speciality that should be required in the first and second-level schools in Yugoslavia in the period 1964/65 - 1974/75.

Forecast:

The estimate for this type of school was based on the secondary business school curricula requirements in Slovenia, Croatia and Serbia respectively, administrative school curricula requirements in Slovenia, secretarial school curricula requirements in Croatia and administrative-secretarial school curricula requirements in Serbia.

There are considerable variations as to how many teachers are necessary (Table V_2), particularly in certain subjects (mathematics, office management, foreign language, social sciences). They result from the difference in the number of periods given to these subjects by the curricula in certain republics (according to the business school curricula the total

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number of periods in particular forms is: for mathematics 9 periods in Slovenia, 17 in Croatia, 8 - 16 in various subtypes of business schools in Serbia; for office management 14 periods in Slovenia, 9 in Croatia, 8 - 12 in Serbia; for political and social organization, which is the only subject out of the group of social sciences that is taught in this type of school, 4 periods in Slovenia 2 periods in IIIrd and 2 periods in IV form) - whilst this subject is not included in secondary business school curricula in Croatia and Serbia.

Table V_3 presents the estimate of the required new teachers per subject in the periods 1964/65 - 1969/70 and 1969/70 - 1974/75 respectively. The two elements taken into consideration in working out the estimate in the above table were the increase in the number of pupils and classes respectively and the need to compensate for the loss of teachers through retirement and death. It was not possible to allow for the possible shortage of teachers in 1964/65 because the corresponding data do not exist.

As the qualification structure of teachers in 1964/65 is not known, it was impossible to add to the planned number of new teachers (D_{69}, D_{74}) the number of new teachers that would be necessary in the planned period if untrained teachers hitherto teaching in this type of school were to be substitued by the trained ones.

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SECONDARY SCHOOLS FOR MEDICAL PERSONNEL

Present situation:

The estimate of the required number of teachers with respect to subjects they taught in 1962/63 was carried out according to the foregoing methodology. Teachers of physical and health education and practical training were assumed to be statistically recorded only once in the bulletin no. 343 (1962 census of teachers). The difference between the total number of teachers in 1962/63 and the teachers of the above two subjects was distributed among the remaining subjects on the basis of the percentage:

$$Xi = \frac{100\ Fi}{\sum_{i=1}^{15} Fi - F12 - F13}$$

in which the number of periods available for a particular subject was represented in the total number of realized periods. The number of periods available for physical and health education and practical training were excluded from the above calculation. The numerical structure of teachers according to subjects they taught in 1962/63, obtained in the above way, was subsequently applied to the total number of teachers in schools for medical personnel in 1964/65 thus resulting in the distribution of teachers by subjects in the base year of the planning period. The qualification structure of teachers in 1964/65 was based on the qualification structure of teachers in 1962/63, which was taken from the census data. The qualification structure of teachers of the following subjects was particularly unsatisfactory: hygiene (96.1% of the teachers teaching this subject were not trained to do so, the group of subjects dealing with medicine-specialities (76.1% untrained) physics (60.7%), mathematics (59.2%), chemistry (58.5%).

Subjects of the group medicine-specialities are generally taught by teachers who graduated from one of the secondary technical schools (including secondary schools for medical personnel). (It can, therefore, be concluded that nurses and medical technicians teach the subjects for which only doctors are qualified).

Forecast:

Planning of the number of teachers required in these schools was based on the curricula requirement in the republics of Slovenia, Croatia and Serbia. As the curricula disclosed essential differences in the number of periods given to technical and theoretical subjects in schools for nurses and medical technicians respectively, it was necessary first of all to estimate the number of pupils in the respective schools for nurses and medical technicians within the planned total number of pupils in secondary schools for medical personnel. This distribution of pupils was based on the information supplied by the Department of Vocational Education of Croatia. The estimate for Yugoslavia therefore relied only upon the numerical relation between the number of pupils in these two subtypes of schools for medical personnel in Croatia (since analogous data for the whole of Yugoslavia were not at our disposal). Of the total number of pupils in schools for medical personnel in Croatia about 66% of them attend schools for nurses and the remaining 34% corresponding schools for medical technicians. On the ground of the above relation the planned total number of classes (total number of classes was obtained by dividing the planned number of pupils by the average number of pupils per class, which, in turn, was obtained by the interpolation of the exponential function between the value 33 in 1964/65 and optimum value 30 which is assumed to be realizable in 1974/75) was divided among the two above quoted subtypes. The next stage was the analysis of the resulting numbers with respect to the curricula appertaining to the two subtypes of schools for medical personnel. The number of periods per subject thus obtained was divided by 22 whereas the number of periods available for practical training, was divided by 33 (figures 22 and 33 respectively represent the standard number of periods for these subjects) and in such a way the number of teachers required for these subjects was determined. The required number of teachers ranges most widely in subjects with a small number of periods available (geography, sociology, technology and economics). Geography is represented with only 1.5 periods a week in the first two forms of secondary schools for medical personnel in Slovenia, whereas it is not taught in this type of school in Croatia and Serbia. The situation is analogous with regard to sociology (it is taught 2 hours a week in the two upper forms in Slovenia only), economics and business management (these subjects are not taught in Croatia).

With respect to the subjects with a larger number of periods available there are great variations as to how many teachers are required for the following subjects: practical training, technical and theoretical subjects, chemistry and biology. Practical training is taught only in nursing schools in Croatia and Slovenia, where it is allotted a fairly large number of periods. It does not at all exist in the curricula for the corresponding schools in Serbia, so that the number of periods available for practical training ranges from: 0 - 4, 0 - 18, 0 - 19, 0 - 20 periods a week in the four forms respectively.

Technical and theoretical subjects comprise the group of subjects medicine - specialities and hygiene - nursing.

The differences in the number of periods available for these subjects in particular republics and in particular subtypes within the same republic are incredible (for the group of subjects medicine-specialities the number of periods in forms I - IV in nursing schools ranges from : 3 - 8, 0 - 12, 4 - 23, 3 - 24; in schools for medical technicians the intervals are as follows: 3 - 17, 0 - 17, 2 - 24, 6 - 22; for hygiene in nursing schools: 4 - 13, 3 - 14, 2 - 11, 2 - 13: in schools for medical technicians: 2, 0 - 12, 0 - 17, 0 - 16).

The situation is very similar with respect to chemistry, biology, physics and mathematics. A wide range of periods available for the above subjects results in considerable variations as to the number of teachers required to teach them.

The estimate of how many new teachers should be required in the period 1964/65 - 1969/70 reveals a surplus of teachers of practical training. From the 1962 census of teachers data it follows that teachers of the above subject taught on the average 23.7 hours a week, which is far below the optimum teaching standard (33) which these teachers would have to achieve and which was taken into account when the estimate of the required number of teachers of practical training was being made. That is the reason why according to table VI_2, which gives the estimate of the teacher requirements by subjects, there appears that a smaller number of teachers is required for practical training in the period 1964/65 - 1972/73 than the number of teachers who were engaged to teach it in 1964/65.

Further, it follows from the census data that secondary schools for medical personnel were very well equipped with full-time and trained teachers of practical training (only 7% of the total number of periods was taught by part-time teachers).

The total number of new teachers that should join the teaching staff of secondary schools for medical personnel in the respective periods 1964/65 - 1969/70 and 1969/70 - 1974/75 is considerably larger than D_{69} and D_{74} respectively for the following subjects: physical and health education, technical and theoretical subjects, the reason being a large proportion of unqualified teachers of these particular subjects (according to 1962 census data). All full-time teachers of physical and health education as well as 89% of the full-time teachers of the group of subjects medicine-specialities and hygiene were not trained to teach these subjects.

SECONDARY TEACHER TRAINING SCHOOLS

Present situation:

In secondary schools of this type there were, in 1962/63 1545 full-time teachers, 25.5% of whom were not trained for the subjects they taught.

In this type of schools a large number (29.17%) of periods was realized by part-time work either by teachers of the same or some other type of school. In order to fit this number of periods within the framework of the average weekly teaching load as realized by full-time teachers in this type of schools (20.3) there would be required 432 additional full-time teachers. While, however, in other types of schools, the number of periods taught by part-time teachers usually indicates the shortage of full-time teachers, in teacher training schools this phenomenon entails a different explanation. It should be remembered that secondary teacher training schools in Croatia are dying out. Therefore in proportion to a significant reduction in the number of pupils and classes ever since 1961/62 full-time teaching staff in teacher training schools has also been reduced to the minimum. Consequently, the teaching obligations that could not be fitted within the framework of the weekly teaching load of the remaining staff were transferred to part-time teachers.

Part-time teachers realize a great proportion of periods not only in subjects represented by a small number of periods (such as hygiene, elements of social sciences, political and social organization of Yugoslavia), which do not give full-time teachers an opportunity to fulfil their weekly standard, but also in mathematics, physics, music, technical and physical training, foreign language and mother tongue.

As regards the qualification structure the situation is particularly unsatisfactory for the following subjects: music (73.39% of the teachers teaching it are not trained to do so) physical training (68.48%) drawing and painting (54.44%), technical training (54.12%), physics (52.17%), mathematics (50.00%) chemistry (44.44%) and biology (29.03%).

Forecast:

The estimate of the required number of teachers in secondary teacher training schools (general, for training teachers of domestic science, teachers of physical education, teachers of technical subjects, pre-school and general supervisor training schools) was based on the curriculum requirements of the secondary teacher training schools in Serbia. Since only one curriculum was at our disposal it was not possible to work out the maximum and the minimum variants of the estimate.

The estimate of the number of new teachers that should enter the teaching profession in the respective periods 1964/65 - 1969/70 1969/70 - 1974/75 shows the greatest shortage of new teachers exactly for those subjects that are in the present situation, predominantly taught by part-time teachers (physical training, mathematics). In some subjects (such as Serbo-Croat, foreign language, biology, drawing and painting and music education) there appears a surplus of teachers in the period 1964/65 - 1969/70 caused by the reduction in pupils of secondary teacher training schools. But if it is desired to improve the qualification structure of teachers of these subjects, which means the substitution of the untrained teachers by the trained ones, then a certain number of new teachers are required even for these subjects (Table VII_3).

SECONDARY ART SCHOOLS

These schools comprise: applied art schools, schools of music, ballet schools and drama schools.

The assessment of the present situation as well as the estimate of the required number of teachers were made separately for applied art schools on the one hand and for the other subtypes on the other. This division was rendered necessary by different teaching systems in the two groups of schools: whereas in applied art schools there is a system of form teaching, in other art schools there is individual instruction.

From the data on the number of teachers in various subtypes of art schools in the period 1959/60 - 1962/63 it follows that 24% of the total number of teachers in art schools taught in applied art schools, 67% in schools of music, 9% in ballet and drama schools.

The total number of art school teachers in 1964/65 was distributed according to the above ratio (for this year there are no data on the number of teachers in particular subtypes of art schools).

Present situation:

a) Applied Art Schools:

Distribution of teachers by subjects (Ui; i 5.12) in 1962 was based on the relation between the number of periods available for particular subjects (Fi; i 5.12) and the total number of periods. The number of periods allotted to physical training (F_5) and practical training (F_{12}) were excluded from the calculation because teachers of these two subjects do not teach anything else, so that it can, be assumed that: $A_5 = U_5$ and $A_{12} = U_{12}$.

The resulting numerical structure of teachers by subjects was then applied to the total number of teachers in applied art schools in 1964/65 (24% of the total number of teachers of arts schools in that year).

The percentage (Zi) of untrained teachers in the total number of teachers of particular subjects in 1962 was applied to the number of teachers in 1964/65. In such a way the number of teachers not trained for particular subjects was estimated for the base year of the planning period. According to this estimate in 1964/65, 35.13% of the total number of teachers were not qualified for the subjects they taught. It is particularly significant that three quarters of that number (73.85%) were teachers of art subjects: applied art and practical training.

From the total weekly number of periods taught in 1962/63, 18.6% was taught part-time or overtime.

b) Schools of Music, Ballet and Drama Schools

As the percentage of teachers in the schools of music in the total number of art school teachers is about 67% the percentage of teachers of ballet and drama schools about 9%, it was estimated that in 1964/65 there were 517 teachers in the schools of music, 69 ballet and drama school teachers (in that year there were altogether 771 teachers in art schools)

Forecast:

a) Applied Art Schools:

The estimate was based on the curriculum requirements for applied art schools in Croatia. There are two branches (drawing and painting branch and plastic design) of this school, each having 4 departments. The number of periods available for general subjects is the same for both branches and all four respective departments. The same cannot be said of art subjects such as applied art and practical training; the number of periods in those subjects varies considerably, which causes variations in the estimate of the required number of teachers of these subjects (Table $VIII_2$).

Moreover, the estimate of the number of new teachers needed by 1969/70 shows a surplus of teachers of mother tongue, foreign language and practical training. The surplus of teachers of practical training remains until 1974/75.

b) Schools of Music, Ballet and Drama Schools

The forecast of the required number of teachers in schools of music, ballet and drama schools was based on the estimated number of pupils in these schools as well as on the average number of pupils per teacher.

The data for the period 1959/60 - 1964/65 show that the number of pupils in schools of music was about 57% of the total number of art school pupils. The ratio of the number of pupils to a teacher is about 5, whereas in ballet and drama schools that ratio is about 7.5.

The estimate of the number of pupils and teachers in ballet and drama schools in 1969/70 and 1974/75 was based on the above data.

The estimate of the required number of new teachers indicates that a relatively large number of new teachers should join the teaching staff of these schools by 1974/75 (126 ballet and drama school teachers, 688 teachers in schools of music, which exceeds the number of teachers who, according to the estimate, taught in these schools in 1964/65).

SCHOOLS FOR SKILLED WORKERS

Present situation:

The survey of the present situation, i.e. the number of teachers per subject and the evaluation of their qualification structure serves, first of all, to help determine the required number of new teachers in the period 1964/65 - 1969/70. It is not possible to give this survey for each branch (metal-manufacturing, electrical engineering, wood and timber manufacturing, textile and others) of this type of school because the structure of schools within these branches as represented in statistical reports does not correspond to the structure on which planning of the number of pupils was based. Accordingly, the data on the number of teachers teaching in these various branches in 1964/65 are incompatible with the data on the number of teachers required for the same schools in the planned period.

The survey of the present situation concerning the teaching staff in schools for skilled workers, therefore, deals with all the schools for skilled workers taken together.

The survey of the present situation is based on the 1962 census of teachers data.

It was assumed that teachers of physical and health education (A5) and practical training (A9) were statistically recorded only once according to the number of subjects they teach. The distribution of the remaining teachers in independent schools (U-A5-A9) was based on the structure of teachers with respect to the subjects they teach (A_i-A5-A9) as recorded in the bulletin no. 343 data, where those teachers were statistically recorded more than once according to the number of subjects they teach.

The total number of teachers in independent schools in 1964/65 (B'64) as well as the estimated number of teachers in schools within school centres (C) were then analysed in the light of the above structure of teachers with respect to the subjects they teach as calculated for 1962/63.

The estimate of teachers (C) in schools for skilled workers which were comprised within school centres was based on the relation of the number of classes appertaining to schools for skilled workers to the number of classes in the school centres (58.67%).

The distribution of these teachers (C) with respect to the subjects they teach was based on the similar distribution for 1962/63.

The number of teachers of subject "i" (Bi,64) in 1964/65, was obtained by adding the estimated number of teachers of that subject in independent schools (B'i,64) to the estimated number of teachers of that subject in schools within school centres (Ci).

From the number of periods taught by part-time teachers it is evident that the above number of full-time teachers was not sufficient. Part-time teaching is tolerated, even recommended, within certain limits (10%), for technical and theoretical subjects but this optimum participation of part-time teaching was considerably exceeded even in the above subjects (it was 27%). 20.9% of the total number of periods taught in independent schools for skilled workers was done by part-time teachers. This is 7.5 times more than the number of periods which, it is thought, should be taught by part-time teachers (10% of the total number of periods available for technical and theoretical subjects).

The percentage of part-time teaching is particularly high in the following subjects: physical and health education, economics and business management, vocational-theoretical subjects, and practical training. All the data on the number of periods realized by part-time and full-time teachers respectively refer exclusively to the schools for skilled workers which are not comprised within school centres (analogous data for the schools for skilled workers within school centres are not known).

Similarly, the percentage of teachers not trained for the subjects they teach is known only for the schools which are not included within school centres. This percentage is extraordinarily high (see Table IX_1), it is not lower that 60% in any of the subjects. (In fact, this percentage is probably lower because the percentage of teachers not trained for the subject they teach is lower in school centres).

The qualification structure of teachers is least satisfactory for the following subjects: natural sciences (physics, mathematics, chemistry), physical and health education, history, vocational-theoretical subjects (although all those teachers with high or higher education were considered to be trained for these subjects) and practical training.

Forecast:

The forecast of the required number of teachers is given for the following branches of schools for skilled workers:

1. Metal-manufacturing
2. Electrical-engineering
3. Wood and timber manufacturing
4. Textile
5. Remaining less significant branches

The forecast is based on the three-year school curricula requirements of the respective branches. The number of pupils was not planned for three- and two-year schools separately. The curricula for these two groups of schools (three-year and two-year ones) could not, therefore, be applied without a previous distribution of pupils with respect to the length of training.

This distribution was, however, not carried out because the error which would have resulted from that estimate was considered to be more serious than the error which is made when the total planned number of classes (those from three- and two-year schools) is viewed in the light of the three-year school curriculum.

The analysis of the three- and two-year school curricula requirements for particular branches showed that e.g. the number of periods available for a particular subject in Ist and IInd forms of the two-year metal manufacturing and electrical-engineering branches (the number of classes in these two branches is 50% of the total number of classes) was within the same range as the number of periods available for the same subject in Ist and IInd forms of three-year schools. There are small deviations with respect to other branches.

The forecast of the required number of teachers was based on the:

1. Metal-manufacturing school curricula - in Slovenia, Croatia, Serbia
2. Electrical-engineering school curricula - in Slovenia and Serbia
3. Wood and timber manufacturing school curricula - in Slovenia and Croatia
4. Textile school curricula - in Slovenia
5. Curricula for the remaining branches taken together - in Croatia (agricultural schools).

In making the forecast of the required number of teachers for this last group of schools for skilled workers there were certain departures from the above mentioned methodology.

The reason for the departure is the following: this group of schools comprises various branches (each represented with a relatively small number of pupils). Only the curricula for the three-year agricultural schools were available. The estimate of the required number of teachers of general subjects, accordingly, was based on this curricula but the same could not be done for technical and theoretical subjects and practical training. The estimate of teacher requirements for these subjects was based on the enquiry made in Croatia at the end of 1964/65. According to that enquiry in the total number of periods realized in this group of schools for skilled workers, general and social science subjects participated with 20.92%, natural science subjects with 13.26%, technical and theoretical subjects with 29.39%, practical training with 27.19% and physical and health education and premilitary education with 9.24%. The estimate of the number of teachers required for technical and theoretical subjects and practical training was, therefore worked out in the following way: the estimate of the required number of teachers for all the subjects except technical and theoretical ones and practical training was based on the agricultural school curricula requirements (as the representative of this group of schools for skilled workers). Further, the estimate of the total number of teachers was based on the data which indicate that teachers teaching general and social science subjects represented 20.92%, teachers teaching natural science subjects 13.26% of the total number of teachers. It was finally worked out that teachers of technical and theoretical subjects participated with 29.39%, teachers of practical training with 27.19% in the total number of teachers.

The same enquiry showed how many periods required for technical and theoretical subjects were taught part-time. These data were submitted to the Department of Vocational Education of Croatia for consideration. Consequently, the optimum share of part-time teaching in the total number of periods required for technical and theoretical subjects was determined. It should be:

- 5% in metal manufacturing schools
- 5% in electrical-engineering schools
- 0% in wood and timber manufacturing schools
- 20% in textile schools
- 20% in other schools for skilled workers

It follows that 10% of the total number of periods available for technical and theoretical subjects in schools for skilled workers is the optimum percentage which should be realized by part-time teaching.

The planned number of teachers required for technical and theoretical subjects was, consequently, diminished by 10%, because for that percentage of the total number of periods required for the above subjects it is not necessary to secure full-time teachers. Tables IXA, B, C, D, E, with index 1, show that the required number of teachers varies considerably for all subjects except physical and health education and mother tongue for which the number of periods allotted is fairly uniform in all the republics and branches of the schools for skilled workers. There is a particularly great range of teachers required to teach chemistry and physics in all the schools for skilled workers, irrespective of particular branches. The situation is hardly better in history, social sciences, economics, business management, technical and theoretical subjects, practical training and mathematics.

These variations are the consequence of extraordinarily great differences as to how many periods should be available for particular subjects according to the curricula requirements in particular republics or within the same republic with respect to various branches of schools for skilled workers. Metal-manufacturing schools may serve as an illustration of

the above statement. The number of periods for particular subjects in the three forms of that type of school ranges as follows:
chemistry: 0 - 4, 0 - 4, 0 - 7;
physics: 0 - 3, 0 - 4, 0;
history: 0, 0 - 6, 0 - 2;
social sciences (social behaviour, political and social organization of Yugoslavia) 0, 0, 0 - 4;
economics and business management: 0 - 3, 0, 1 - 4;
technical and theoretical subjects: 3 - 18, 0 - 23, 2 - 26;
practical training: 12 - 24, 4 - 24, 2 - 24;
mathematics: 2 - 5, 2 - 7, 2 - 7;

Table IX_3 giving the estimated number of new teachers required in schools for skilled workers, shows great differences between the respective periods 1964/65 - 1969/70 (D69) and 1969/70 - 1974/75 (D74) with regard to the required new teachers. The differences are particularly pronounced for the subjects in the teaching of which according to 1962 census data part-time teachers participated with the highest percentage (physical and health education, economics and business management, technical and theoretical subjects, and practical training). These differences are caused by the inherited shortage of full-time teachers, which should be compensated for (as was planned) in the first half of the planning period.

SECOND-LEVEL SCHOOLS

SUMMARY

Tables X_2 and X_3, which indicate the required number of teachers for all the second-level schools in each year of the planning period and for each particular subject as well as the number of new teachers that should join the teaching staff of these schools in the planning period, were obtained by summing up all the corresponding data from tables with index 2 and 3 respectively which refer to particular types of second-level schools.

Table X_2 shows that there is considerable uniformity with respect to the number of periods available for educational fields (music, physical training, drawing and painting) in the same type of school in different republics and within the same republic respectively. The range of the required number of teachers is smallest for these subjects. Similarly, there are no great differences in the number of periods available, and, consequently, in the required number of teachers for the subjects: mother tongue, classical and foreign languages. The situation is completely different with respect to the subjects: hygiene, office management, economics, business management, chemistry, practical training, social sciences. The number of periods available for these subjects ranges considerably from republic to republic; the differences even exist for the same type of school within a single republic. That is the reason why the required number of teachers for these subjects varies so much.

Table X_3 shows that in the period 1964/65 - 1974/75 31438 new teachers should be added to the second-level school teaching staff. The number of new teachers should be 37577 if the existing untrained teachers (6139) in second-level schools were substituted by the trained ones. There is a surplus of music teachers, which originated in grammar schools (gymnasium) for the already mentioned reasons (in the past music was taught in all the subtypes of grammar schools, whereas it is now taught only in grammar schools of general type). There is a particularly great number of untrained teachers for technical and theoretical subjects, mathematics, practical training and mother tongue.

For some subjects, such as pedagogical sciences, philosophy, logic, psychology, technical education, economics and business management, classical languages, physical and health education and some others, the required number of new teachers in the period 1964/65 - 1969/70 is much larger than the corresponding number of required new teachers in the period 1969/70 - 1974/75. The above quoted subjects are exactly those for the teaching of which greatest number of part-time teachers was engaged. The differences as to the required number of new teachers in the two five-year periods result, therefore, from the tendency to compensate for the shortage of full-time teachers of these subjects by 1970.

B. DIAGRAMS

Diagram 1

PUPIL/CLASS RATIO

Schools for skilled workers

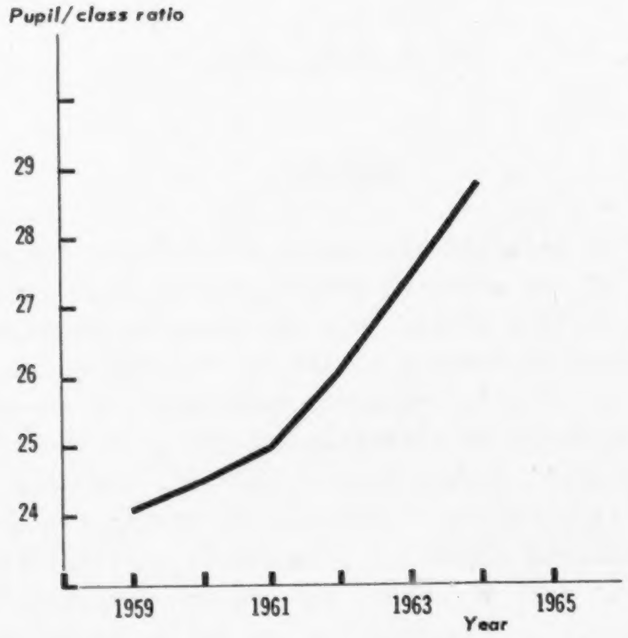


Diagram 2

PUPIL/CLASS RATIO

Eight year primary schools

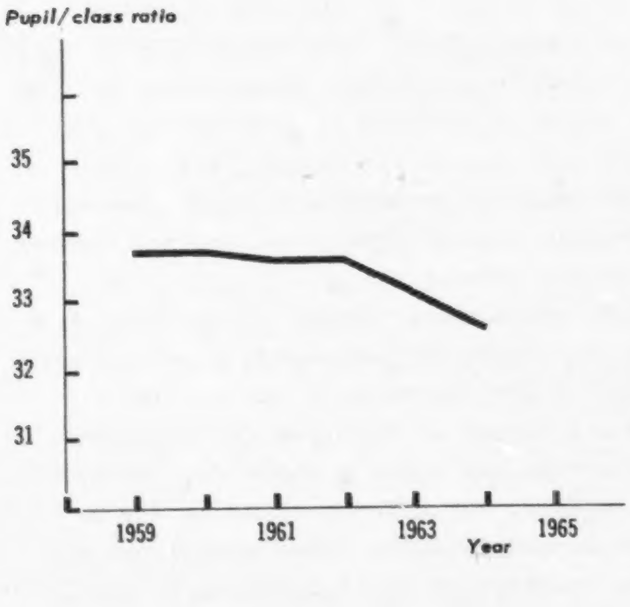


Diagram 3

PUPIL/CLASS RATIO

Grammar schools (Gymnasium)

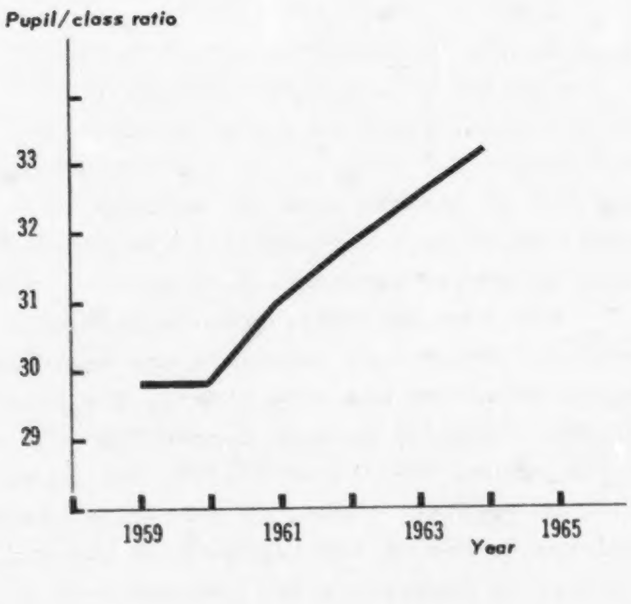


Diagram 4

PUPIL/CLASS RATIO

Secondary technical schools

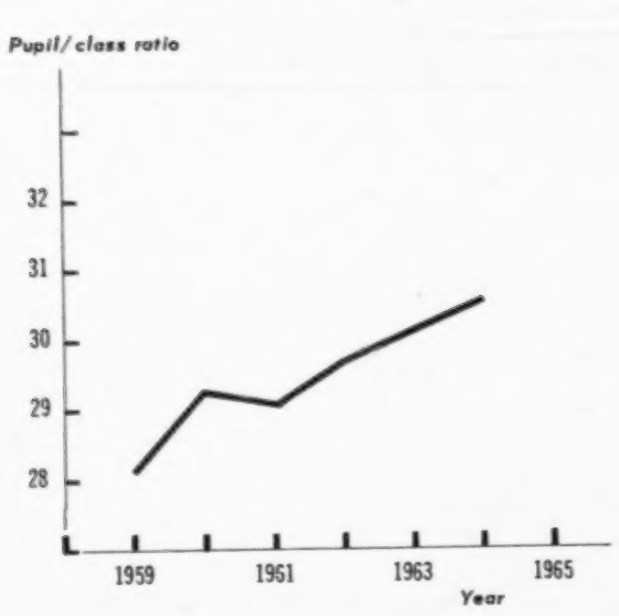


Diagram 5

PUPIL/CLASS RATIO

Secondary teacher training schools

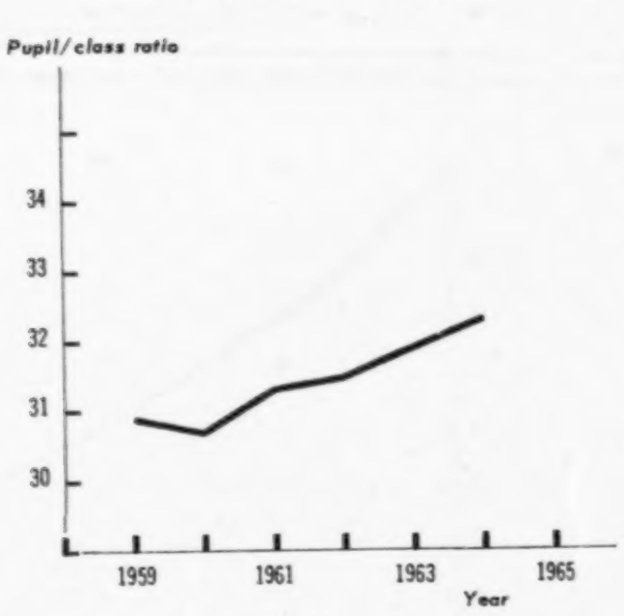


Diagram 6

PUPIL/CLASS RATIO

Secondary business schools, administrative and secretarial schools

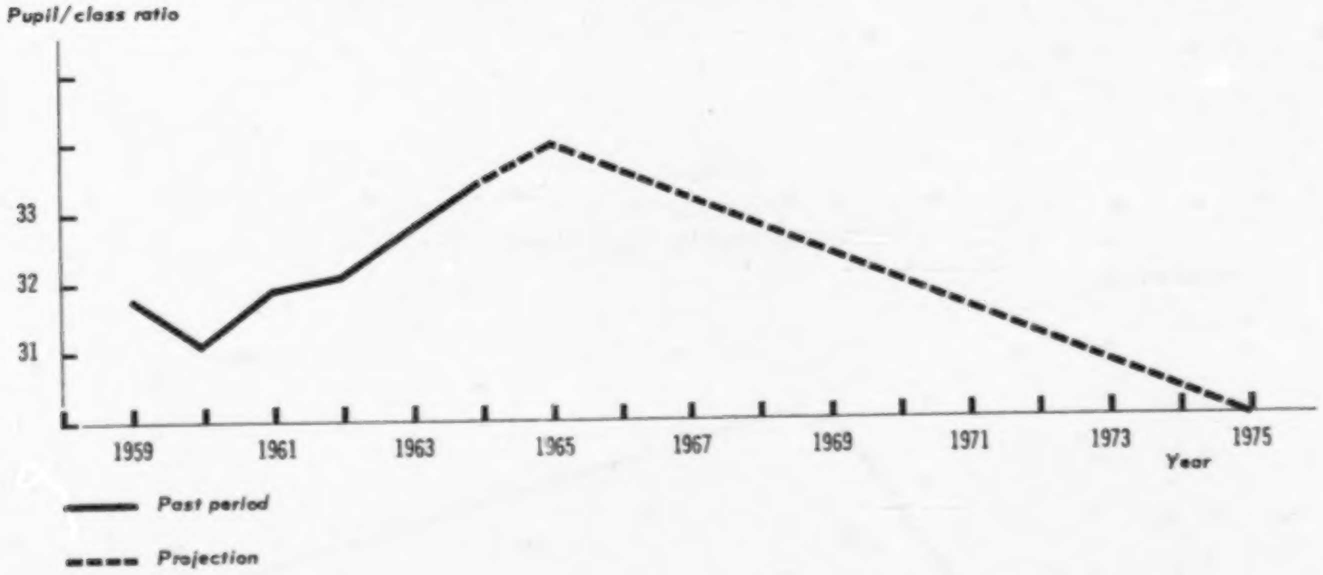


Diagram 7

EXTRAPOLATION OF THE STRUCTURE COMBINED CLASSES
ACCORDING TO THE TOTAL NUMBER OF CLASSES IN THE EIGHT YEAR PRIMARY SCHOOLS

$y = 23.3804 \times 0.92474^{x}$

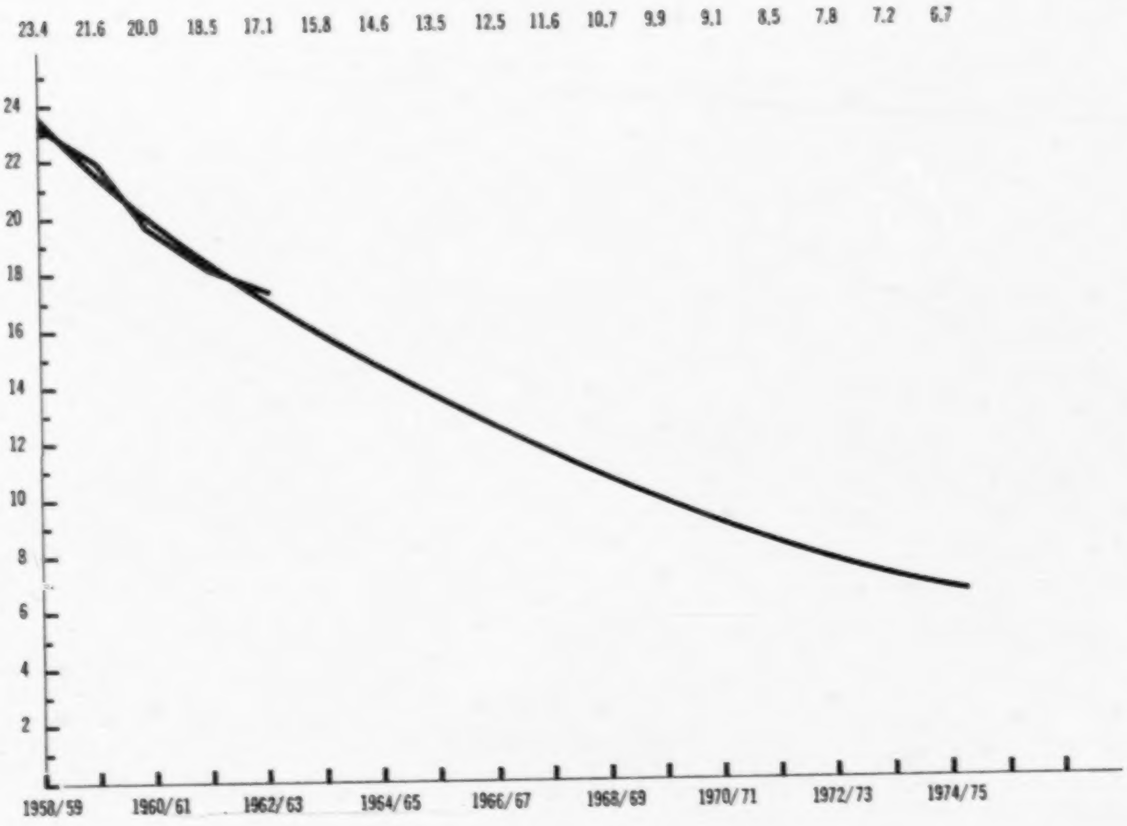


Diagram 8

PUPIL/CLASS RATIO

Secondary schools for medical personnel

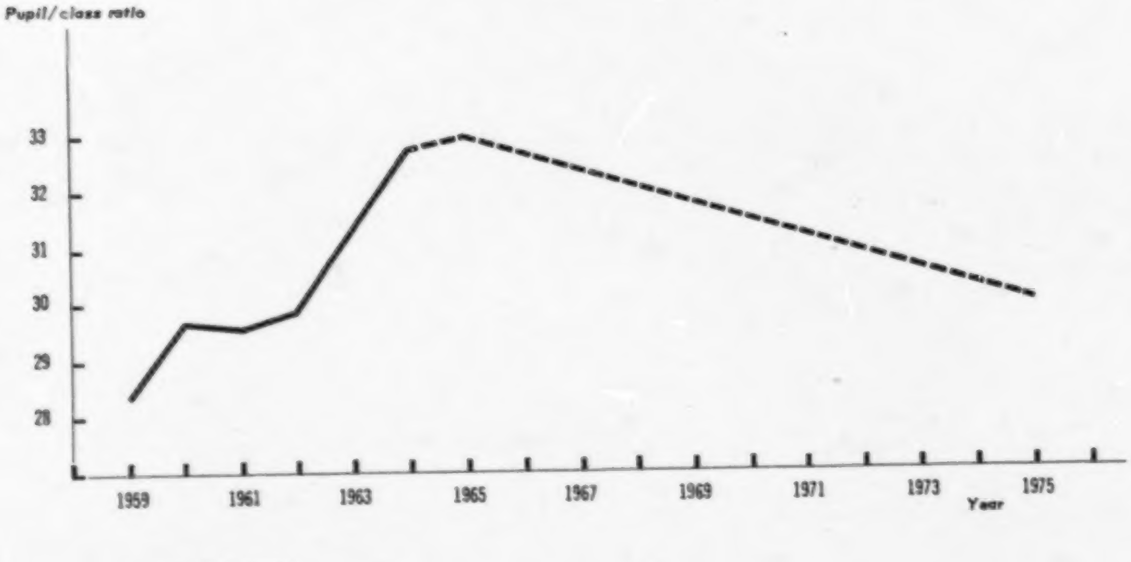
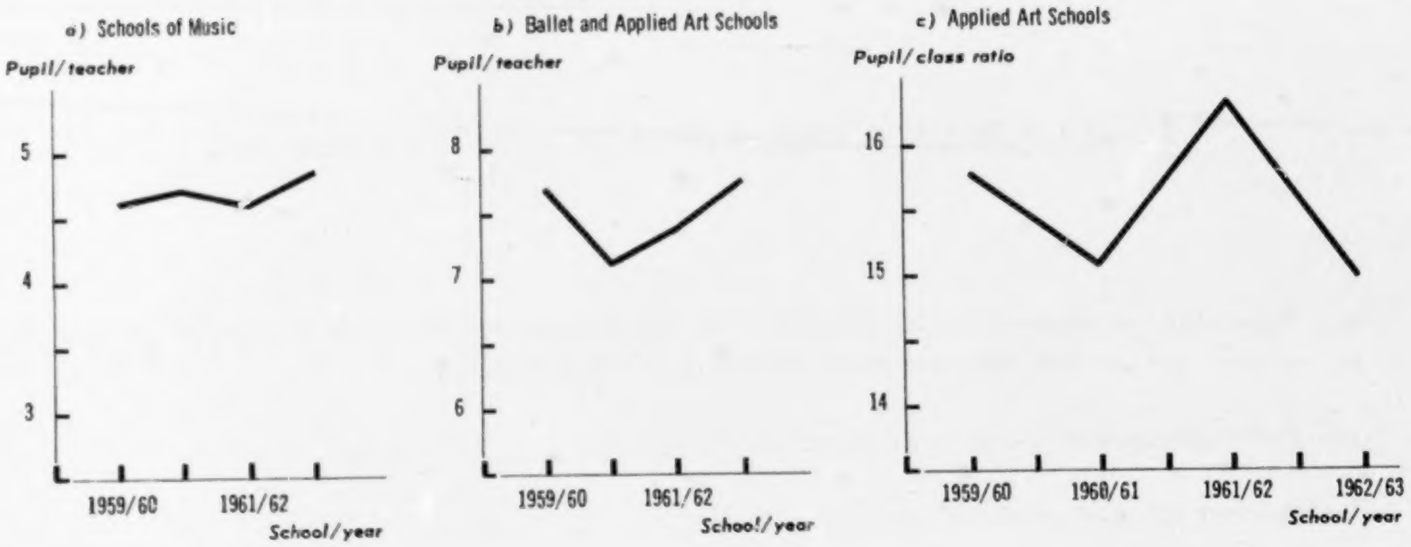


Diagram 9

PUPIL/TEACHER RATIO AND PUPIL/CLASS RATIO



a) Schools of Music

b) Ballet and Applied Art Schools

c) Applied Art Schools

C. LIST OF REFERENCE WORKS ON WHICH THE RESEARCH HAS BEEN BASED

1. Quantitative projection of education in Yugoslavia for the period I965/66 to I974/75, worked out in the Mediterranean Regional Project Bureau.
2. First and second-level school curricula for Croatia, Serbia and Slovenia.
3. Enquiry of the Republic Bureau of Statistics for Croatia
4. Educational standards and optimal relations for the estimation of the personnel basis in vocational schools (Department of Vocational Education of Croatia)
5. Federal Bureau of Statistics bulletins nos.: 72, 118, 122, 158, 194, 215, 261, 268, 292, 313, 336, 343, 346, 355, 356.
6. Supplements to the Federal Bureau of Statistics bulletins nos.: 313, 336, 343, 356, referring to the data about the subjects not recorded in the above bulletins.

D. LIST OF THE SCHOOLS WITH CORRESPONDING TABLES

1.	Eight year Primary Schools	table I
2.	Grammar Schools (Gymnasium)	table II
3.	Secondary Technical Schools	table III
	Mechanical-engineering	table IIIA
	Electrical-engineering	table IIIB
	Civil-engineering	table IIIC
	Technological	table IIID
	Other types	table IIIE
4.	Agricultural, Forestry and Veterinary Schools	table IV
5.	Secondary Business Schools, Administrative and Secretarial Schools	table V
6.	Secondary Schools for Medical Personnel	table VI
7.	Secondary Teacher Training Schools	table VII
8.	Secondary Art Schools	table VIII
9.	Schools for Skilled Workers	table IX
	Metal manufacturing branch	table IXA
	Electrical-engineering branch	table IXB
	Wood and timber manufacturing branch	table IXC
	Textile branch	table IXD
10.	Secondary-level Schools - Total	table X

E. LIST OF SUBJECTS ON WHICH THIS RESEARCH HAS BEEN BASED:

I. PRIMARY SCHOOLS

1. Mother tongue
2. Foreign language
3. History
4. Geography
5. Social studies
6. Mathematics
7. Biology
8. Physics
9. Chemistry
10. Physical and health education
11. Drawing and painting
12. Musical education
13. Technical education
14. Domestic sciences

II. SECOND-LEVEL SCHOOLS

1. Mother tongue
2. Foreign language
3. Classical language
4. Geography
5. History
6. Social sciences
7. Economics and business management
8. Biology
9. Mathematics
10. Physics
11. Chemistry
12. Physical and health education
13. Drawing and painting
14. Musical education
15. Technical education
16. Psychology, logic and philosophy
17. Hygiene
18. Office management
19. Pedagogic sciences
20. Applied art
21. Practical training
22. Technical and theoretical subjects

NOTA BENE: Those subjects which are included in the group of special and theoretical subjects can be seen in tables illustrating particular types of schools.

F. LIST OF SYMBOLS

A_i	Number of teachers who taught the subject "i" in 1962
S_i	Average weekly number of teaching periods as taught by the teachers of the subject "i" within the framework of their regular teaching obligations
F_i	Total weekly number of teaching periods as taught by the teachers of the subject "i" within the framework of their regular teaching obligations
X_i	Percentage of the teaching periods allotted to the subject "i" in the total number of teaching periods
U_i	Estimated number of teachers who taught the subject "i" in 1962 (this time, teachers are represented in physical terms thus differing from A_i)
$B_{i,64}$	Estimated number of teachers of the subject "i" in 1964
$N_{i,64}$	Estimated number of untrained teachers of the subject "i" in 1964
D_{69}	Required number of teachers who should enter the teaching profession by 1969/70
D_{74}	Required number of teachers who should enter the teaching profession in the period 1969/70 to 1974/75
x	/in tables with the index 3/ Number of teachers / untrained who should each year be substituted by the trained ones so that in the last year of the planned period there would be no untrained teachers

NOTA BENE: Other symbols which are not used in all the tables will be listed under the respective tables.

G. DETAILED TABLES

TABLE I_1

ESTIMATE OF THE NUMBER OF TEACHERS FOR PARTICULAR SUBJECTS IN 1964/65.

EIGHT YEAR PRIMARY SCHOOLS

Subjects	Ai	Si	Fi	Xi	Ui	Yi	$Bi,_{64}$	Zi	$Ni,_{64}$
1. Combined subject teaching	44233	22.4	990819	-	44233	50.81	49207	2.5	1230
2. Mother tongue	7915	14.2	112393	17.16	7349	8.44	8173	33.2	2713
3. Foreign language	5494	12.3	66111	10.09	4322	4 96	4804	27.7	1331
4. Mathematics	6165	14.3	88159	13.46	5765	6.62	6412	43.5	2789
5. Physics	3184	7.8	24835	3.79	1623	1.86	1801	34.5	621
6. Chemistry	2903	7.2	20902	3.19	1366	1.57	1520	25.5	388
7. History	3806	10.3	39202	5.98	2561	2.94	2848	25.1	715
8. Geography	3735	10.2	38097	5.82	2492	2.86	2770	24.5	679
9. Biology	5409	8.4	45436	6.93	2968	3.41	3303	34.6	1143
10. Drawing and painting	3260	11.0	35860	5.47	2342	2.69	2605	59.8	1558
11. Technical education	4140	12	51599	7.88	3374	3.88	3757	79.6	2991
12. Physical education	4647	14	69397	10.59	4536	5.21	5047	61.7	3114
13. Music education	2994	13	40697	6.21	2659	3.05	2953	54.1	1598
14. Domestic sciences	2850	7	22419	3.42	1465	1.68	1627	-	-
	100735		1645926	99.99	87055	99.98	96827		

$F = \lesssim F_i - F1 - 665107$ Fi stands for the total weekly number of hours
Fi stands for the weekly number of periods allotted to subjects "i"

U = 87055 (number of teachers in 1962)

Up = U - Ul = 42822

B_{64}= 96827 (total number of teachers in 1964/65)

Yi % B_{64}=Bi,64 (Bi,64 stands for the number of teachers of subject "i"

Zi % Ai =Ni, 62 (Ni, 62 stands for the number of untrained teachers for the subject " i")

Zi % Bi, 64 = Ni, 64

TABLE I_2

EIGHT YEAR PRIMARY SCHOOLS

Academic Year

	1965/66				1966/67				1967/68				1968/69			
	V	VI	VII	VIII	V	VI	VII	VIII	V	VI	VII	VIII	V	VI	VII	VIII
Number of pupils in single-level classes	342863	319246	279993	224658	342389	327797	282802	239052	345607	326931	290010	241145	343817	329969	289214	247266
Number of classes	9796.1	9121.3	7999.8	6418.8	9782.5	9365.6	8080.1	6830.0	9874.5	9340.9	8286.0	6889.9	9823.4	9427.7	8263.2	7064.7

Estimate of the required number of teachers

	1965/66			1966/67			1967/68			1968/69		
	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	6921	7144	7366	7063	7285	7507	7126	7350	7575	7162	7386	7609
2. Foreign language	3890	4218	4546	3967	4305	4644	4000	4345	4690	4019	4367	4715
3. History	2140	2140	2140	2207	2207	2207	2229	2229	2229	2251	2251	2251
4. Geography	2140	2140	2140	2207	2207	2207	2229	2229	2229	2251	2251	2251
5. Social sciences	891	1886	2882	889	1895	2901	898	1916	2934	893	1911	2929
6. Mathematics	6061	6491	6921	6192	6628	7063	6253	6690	7126	6287	6724	7162
7. Biology	3445	3668	3890	3522	3744	3967	3551	3775	4000	3572	2796	4019
8. Physics	1311	1638	1966	1355	1694	2033	1380	1725	2069	1393	1741	2090
9. Chemistry	1311	1311	1311	1355	1355	1355	1380	1380	1380	1393	1393	1393
10. Physical and health education	3890	4218	4546	3967	4306	4644	4000	4345	4690	4019	4367	4715
11. Drawing and painting	1961	2496	3031	1993	2544	3096	2012	2569	3126	2018	2581	3144
12. Music education	2375	2703	3031	2418	2757	3096	2437	2781	3126	2447	2796	3144
13. Technical education	2140	2586	3031	2207	2652	3096	2229	2678	3126	2251	2697	3144
14. Domestic sciences	1070	1605	2140	1103	1655	2207	1114	1671	2229	1125	1688	2251
Total	39546	44244	48941	40445	45234	50023	40838	45683	50529	41081	45949	50817

s - mean
m - minimum
M - maximum

TABLE I_2 (cont'd)

EIGHT YEAR PRIMARY SCHOOLS

Academic Year

	1969/70				1970/71				1971/72			
	V	VI	VII	VIII	V	VI	VII	VIII	V	VI	VII	VIII
Number of pupils in single-level classes	370932	327862	291549	246289	376924	356634	306316	272941	381847	361639	332501	286118
Number of classes	10598.1	9367.5	8330.0	7036.8	10769.2	10191.3	8751.9	7798.3	10910.0	10332.5	9500.0	8174.8

Estimate of the required number of teachers

	1969/70			1970/71			1971/72		
	m	s	M	m	s	M	m	s	M
1. Mother tongue	7332	7573	7813	7773	8017	8262	8041	8289	8537
2. Foreign language	4120	4469	4818	4363	4739	5115	4504	4906	5307
3. History	2249	2249	2249	2431	2431	2431	2550	2550	2550
4. Geography	2249	2249	2249	2431	2431	2431	2550	2550	2550
5. Social sciences	963	2035	3107	979	2090	3200	992	2137	3283
6. Mathematics	6424	6878	7332	6820	7296	7773	7076	7559	8041
7. Biology	3638	3879	4120	3873	4118	4363	4008	4256	4504
8. Physics	1397	1746	2095	1505	1881	2257	1607	2008	2410
9. Chemistry	1397	1397	1397	1505	1505	1505	1607	1607	1607
10. Physical and health education	4120	4469	4818	4363	4739	5115	4504	4906	5307
11. Drawing and painting	2088	2650	3212	2195	2803	3410	2265	2901	3538
12. Music education	2514	2863	3212	2658	3034	3410	2735	3137	3538
13. Technical education	2249	2730	3212	2431	2921	3410	2550	3044	3538
14. Domestic sciences	1124	1687	2249	1216	1823	2431	1273	1911	2550
Total	41864	46874	51883	46992	49828	55113	46262	51761	57260

s - mean
m - minimum
M - maximum

TABLE I_2 (cont'd)

EIGHT YEAR PRIMARY SCHOOLS

Academic Year

	1972/73				1973/74				1974/75			
	V	VI	VII	VIII	V	VI	VII	VIII	V	VI	VII	VIII
Number of pupils in single-level classes	384268	386445	337460	310900	387209	368651	341837	315179	389263	371060	343232	318912
Number of classes	10979.1	10478.4	9642.7	8882.9	11063.1	10532.9	9766.8	9005.1	11121.8	10601.7	9806.6	9111.8

Estimate of the required number of teachers

	1972/73			1973/74			1974/75		
	m	s	M	m	s	M	m	s	M
1. Mother tongue	8245	8495	8744	8321	8572	8824	8377	8629	8882
2. Foreign language	4610	5031	5452	4651	5078	5505	4682	5112	5542
3. History	2637	2637	2637	2664	2664	2664	2684	2684	2684
4. Geography	2637	2637	2637	2664	2664	2664	2684	2684	2684
5. Social sciences	998	2167	3337	1006	2187	3368	1011	2200	3388
6. Mathematics	7269	7757	8245	7340	7831	8321	7389	7883	8377
7. Biology	4111	4361	4610	4149	4400	4651	4177	4429	4682
8. Physics	1684	2105	2526	1707	2133	2560	1720	2150	2580
9. Chemistry	1684	1684	1684	1707	1707	1707	1720	1720	1720
10. Physical and health education	4610	5031	5452	4651	5078	5505	4682	5112	5542
11. Drawing and painting	2316	2975	3635	2338	3004	3670	2353	3024	3695
12. Music education	2793	3214	3635	2817	3244	3670	2835	3265	3695
13. Technical education	2637	3136	3635	2664	3167	3670	2684	3190	3695
14. Domestic sciences	1318	1978	2637	1332	1998	2664	1342	2013	2684
Total	45549	53208	58866	48011	53727	59443	48340	54095	59850

s - mean
m - minimum
M - maximum

TABLE I$_2$ ''

ESTIMATE OF THE REQUIRED NUMBER OF TEACHERS

EIGHT YEAR PRIMARY SCHOOLS	Academic Year									
	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75
Weekly teaching load per teacher	16.8	17.3	17.8	18.4	18.9	19.5	20.1	20.8	21.4	22.0
1. Mother tongue	9 355	9 267	9 085	8 834	8 815	9 043	9 076	8 987	8 812	8 629
2. Foreign language	5 525	5 476	5 370	5 223	5 202	5 346	5 372	5 322	5 220	5 112
3. History	2 802	2 807	2 755	2 692	2 618	2 742	2 792	2 789	2 739	2 684
4. Geography	2 802	2 807	2 755	2 692	2 618	2 742	2 792	2 789	2 739	2 684
5. Social sciences	2 470	2 410	2 368	2 286	2 369	2 358	2 340	2 292	2 248	2 200
6. Mathematics	8 500	8 431	8 269	8 042	8 006	8 230	8 277	8 206	2 050	7 883
7. Biology	4 803	4 762	4 666	4 540	4 515	4 645	4 660	4 613	4 523	4 429
8. Physics	2 145	2 155	2 132	2 082	2 032	2 122	2 199	2 227	2 193	2 150
9. Chemistry	1 717	1 724	1 706	1 666	1 626	1 698	1 760	1 781	1 755	1 720
10. Physical and health education	5 523	5 478	5 370	5 223	5 202	5 346	5 372	5 322	5 220	5 112
11. Drawing and painting	3 269	3 236	3 175	3 087	3 085	3 162	3 177	3 147	3 088	3 024
12. Music education	3 540	3 507	3 434	3 344	3 333	3 422	3 435	3 400	3 335	3 265
13. Technical education	3 386	3 373	3 310	3 226	3 178	3 295	3 333	3 317	3 256	3 190
14. Domestic sciences	2 102	2 105	2 065	2 019	1 964	2 056	2 093	2 092	2 054	2 013
Total	57 937	57 538	56 443	54 956	54 563	56 207	56 678	56 284	55 232	54 095

TABLE I_3

ESTIMATE OF THE REQUIRED NUMBER OF NEW TEACHERS FOR THE PERIODS 1964/65-1969/70 (D_{69}) AND 1969/70-1974/75 (D_{74})

EIGHT YEAR PRIMARY SCHOOLS	MINIMUM				MAXIMUM				AVERAGE				
subjects	D_{69}	Total	D_{74}	Total	D_{69}	Total	D_{74}	Total	D_{69}	Total	D_{74}	Total	X
1. Combined subject teaching	12916	13431	7661	8176	12916	13431	7661	8176	12916	13411	7661	8176	103
2. Mother tongue	331	1471	2208	3348	842	1982	2304	3445	587	1728	2257	3397	228
3. Foreign language	-7	553	1214	1774	734	1294	1490	2050	363	923	1352	1912	112
4. History	-210	90	799	1099	-210	90	799	1099	-210	90	799	1099	60
5. Geography	-139	146	799	1084	-139	146	799	1084	-139	146	799	1084	57
6. Social sciences	1023	1023	195	195	3300	3300	764	764	2162	2162	479	479	0
7. Mathematics	973	2143	1987	3157	1937	3107	2208	3378	1455	2625	2098	3268	234
8. Biology	850	1330	1117	1597	1362	1842	1214	1694	1106	1586	1165	1645	96
9. Physics	-159	101	552	812	582	842	829	1089	211	471	691	951	52
10. Chemistry	97	262	552	717	97	262	552	717	97	262	552	717	33
11. Physical and health educ.	-229	1081	1214	2524	513	1823	1490	2800	142	1452	1352	2662	262
12. Drawing and painting	-159	496	594	1249	1035	1690	994	1649	438	1093	794	1449	131
13. Music education	-24	646	717	1387	717	1387	994	1664	347	1017	855	1525	134
14. Technical education	-1039	216	799	2054	-16	1239	994	2249	-528	727	797	2152	251
15. Domestic sciences	291	-	402	-	904	-	799	-	307	-	600	-	-
Total	13933	22989	20810	29173	24574	32435	23892	31858	19254	27713	22351	30516	

D_{69} stands for the required number of teachers who should enter the teaching profession (or stop teaching) by 1969/70.

D_{74} analogous to D_{69} for the period 1969/70 - 1974/75.

Total = D_{69} + 5x is the number of teachers who should enter the teaching profession (or stop teaching). It results from the increase in the number of pupils, shortage of teachers caused by retirement and death and substitution of untrained teachers by the trained ones.

x = 0.084 $Ni,_{64}$ ($Ni,_{64}$ is the number of untrained teachers in 1964).

TABLE I_3''

ESTIMATE OF THE REQUIRED NUMBER OF NEW TEACHERS FOR THE PERIODS 1964/65 - 1969/70 (D_{69}) AND 1969/70 - 1974/75 (D_{74})

EIGHT YEAR PRIMARY SCHOOLS

	D_{69}	T_{69}	D_{74}	T_{74}	X
1. Mother tongue	1 906	3 046	1 122	2 262	228
2. Foreign language	1 142	1 702	683	1 243	112
3. History	182	482	462	762	60
4. Geography	253	538	462	747	37
5. Social sciences	2 516	2 516	175	175	0
6. Mathematics	2 653	3 823	1 068	2 238	234
7. Biology	1 762	2 262	585	1 065	96
8. Physics	515	775	430	690	52
9. Chemistry	340	505	343	508	33
10. Physical and health education	920	2 230	683	1 993	262
11. Drawing and painting	900	1 555	397	1 052	131
12. Music education	846	1 516	427	1 097	134
13. Technical education	-52	1 203	489	1 744	251
14. Domestic sciences	602	602	346	346	-
Total	14 505	22755	7 672	15 922	1 650

TABLE I_4

ESTIMATE OF THE REQUIRED NUMBER OF TEACHERS IN CLASSES WITH COMBINED SUBJECT TEACHING SYSTEM IN

EIGHT YEAR PRIMARY SCHOOLS

	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75
% of pupils in mixed-level classes	13.5	12.5	11.6	10.7	9.9	9.1	8.5	7.8	7.2	6.7
total number of pupils in lower forms	1668129	1676579	1691737	1714797	1718222	1720798	1720783	1720548	1730476	1750223
number of pupils in single-level classes (lower forms)	1442932	1467007	1495496	1531314	1548118	1564205	1574516	1586345	1605882	1632958
number of pupils in mixed-level classes (lower forms)	225197	209572	196241	183483	170104	156593	146267	134203	124594	117265
number of pupils in mixed-level classes (upper forms)	182095	170291	157951	145015	135878	131431	126534	118385	109620	102149
total number of pupils in mixed-level classes	407292	379863	354192	328498	305982	288024	272801	252588	234214	219414
number of single-level classes	41227	41914	42728	43752	44232	44692	44986	45324	45882	46656
number of mixed-level classes	13576	12662	11806	10950	10199	9601	9093	8420	7807	7314
total number of classes with combined subject teaching system	54803	54576	54534	54702	54431	54293	54079	53744	53689	53970

TABLE II_1

SURVEY OF THE PRESENT SITUATION (1964/65)

GRAMMAR SCHOOLS (GYMNASIUM)

Subjects	Ai	Si	Fi=SiAi	Xi	Ui	Yi	B,64	Zi/B 62/	Ni,64
1. Classical lang.	328	11.4	3739.2	4.60	199	4.10	281	13.41	38
2. Social sciences	353	13.0	4589.0	5.64	244	5.02	343	8.88	30
3. Philosophy, logic psychology	303	6.8	2060.4	2.53	109	2.24	153	10.89	17
4. Technical educ.	210	16.7	3507.0	4.31	186	3.83	262	59.52	156
5. Physical and health education	285	20.6	5871.0		285	5.87	402	67.37	271
6. Music educ. and music	73	11.6	846.8		73	1.50	103	71.24	73
7. Economics and business manag.	2	8.0	16.0	0.02	1	0.02	1	0.00	0
8. Mother tongue	756	16.3	12322.8	15.16	655	13.48	922	4.89	45
9. Foreign lang.	934	13.7	12795.8	15.74	679	13.97	957	13.28	127
10. Mathematics	855	12.9	11029.5	13.57	586	12.06	825	21.87	180
11. Physics	509	11.7	5955.3	7.33	317	6.52	446	30.84	138
12. Chemistry	346	13.0	4498.0	5.53	239	4.92	337	39.88	134
13. History	588	14.6	8584.8	10.56	456	9.38	642	9.69	62
14. Geography	391	15.4	6021.4	7.41	320	6.59	451	8.44	38
15. Biology	346	15.3	5293.8	6.51	281	5.78	395	21.97	87
16. Drawing and painting	182	9.0	1638.0		182	3.75	257	38.46	99
17. Other subjects	82	10.6	869.2	1.07	46	0.95	65	53.66	35
Total	6543		89638.0	99.98	4858	99.98	6842		1530

F = 81282.2

Ai comes from bulletin n° 343

$F = \sum Fi - F_5 - F_6 - F_{16}$

$Xi = \frac{Fi}{F} 100$

U = 4858 (total number of full-time teachers as recorded in bulletin n° 356 reduced by the number of teachers who are not teaching at the moment)

$Up = U - U_5 - U_6 - U_{16} = 4318$

Xi % Up = Ui (i = 5, 6, 16) $U_5 = A_5$; $U_6 = A_6$; $U_{16} = A_{16}$

Yi % U = Ui

B 64 = total number of full-time teachers in 1964/65 (Bulletin n° 355)

Yi % B 64 = Bi, 64

B 64 = 6842

Zi % Ai = N 62 ; Zi % Bi, 64 = Ni, 64

N_{62} = total number of untrained teachers in 1962/63 (Bulletin n° 343)

Ni,64 = estimated number of untrained teachers per subject

TABLE II_2

GRAMMAR SCHOOLS
(GYMNASIUM)

Academic Year

	1965/66				1966/67				1967/68			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	62 736	48 733	40 521	32 384	60 875	50 786	41 665	36 451	63 637	49 280	43 464	37 480
Number of classes	2091.2	1624.4	1350.7	1079.5	2029.2	1692.9	1388.4	1215.0	2121.2	1642.7	1448.8	1249.3

Estimate of the required number of teachers

	1965/66			1966/67			1967/68		
	m	s	M	m	s	M	m	s	M
1. Mother tongue	1037	1083	1128	1061	1109	1157	1090	1139	1187
2. Mathematics	1151	1187	1223	1186	1225	1264	1209	1250	1290
3. Physics	594	605	615	612	623	634	623	635	646
4. Chemistry	361	387	413	377	404	430	381	408	434
5. Biology	528	532	535	532	538	544	561	568	574
6. History	709	709	709	724	724	724	741	741	741
7. Geography	448	477	505	461	490	519	469	500	530
8. Social sciences	253	296	338	253	300	346	259	307	355
9. Economics and business manag.	75	120	165	79	130	180	82	134	186
10. Philosophy, logic and psychology	239	248	257	258	267	276	267	277	286
11. Foreign language	921	924	926	950	952	954	969	972	974
12. Classical language	371	381	390	374	384	393	379	389	399
13. Technical education	420	484	548	433	495	557	444	509	574
14. Physical and health educ.	825	828	830	848	851	854	866	870	873
15. Drawing and painting	314	334	353	317	338	358	327	347	367
16. Music education	23	23	23	23	23	23	24	24	24
TOTAL	8269	8618	8958	8488	8853	9213	8691	9070	9440

m - minimum
M - Maximum
s - mean

TABLE II_2 (cont'd.)

GRAMMAR SCHOOLS

(GYMNASIUM)

Academic Year

	1968/69				1969/70				1970/71			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	61 151	51 516	42 133	39 098	62 478	49 980	47 749	38 429	60 270	50 658	44 544	42 697
Number of classes	2038.4	1717.2	1404.4	1303.3	2082.6	1666.0	1591.6	1281.0	2009.0	1688.6	1484.8	1423.2

Estimate of the required number of teachers

	1968/69			1969/70			1970/71		
	m	s	M	m	s	M	m	s	M
1/	1088	1138	1187	1115	1166	1216	1111	1162	1213
2/	1212	1253	1293	1238	1281	1323	1237	1281	1325
3/	624	636	647	642	654	665	637	649	661
4/	384	412	439	400	427	453	395	423	450
5/	540	547	553	556	563	570	547	554	560
6/	737	737	737	757	757	757	748	748	748
7/	472	502	531	471	505	538	479	510	541
8/	256	305	354	258	308	357	254	307	360
9/	81	136	190	88	142	196	87	146	205
10/	269	279	288	283	293	303	290	300	310
11/	971	974	976	994	996	998	993	996	998
12/	378	388	398	378	389	400	374	385	396
13/	446	510	574	458	523	587	459	522	585
14/	867	870	873	887	894	901	885	889	892
15/	322	343	363	328	349	369	326	347	367
16/	24	24	24	24	24	24	24	24	24
TOTAL	8671	9054	9427	8877	9271	9657	8846	9243	9635

m – minimum

M – Maximum

s – mean

TABLE II_2 (cont'd.)

Academic Year

GRAMMAR SCHOOLS (GYMNASIUM)	1971/72				1972/73				1973/74			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	64 170	48 868	45 148	39 670	63 923	52 030	43 552	40 377	65 800	51 830	46 370	38 944
Number of classes	2139.0	1628.9	1504.9	1322.3	2130.8	1734.3	1451.7	1345.7	2193.3	1727.7	1545.7	1298.1

Estimate of the required number of teachers

	1971/72			1972/73			1973/74		
	m	s	M	m	s	M	m	s	M
1/	1112	1162	1211	1122	1173	1224	1140	1191	1242
2/	1233	1276	1318	1248	1291	1333	1266	1309	1351
3/	635	645	655	642	654	666	654	666	677
4/	389	416	442	394	422	449	402	430	458
5/	552	559	565	557	564	570	569	576	583
6/	753	753	753	760	760	760	775	775	775
7/	477	509	540	487	518	548	488	521	553
8/	261	311	361	265	316	366	269	319	369
9/	86	141	196	84	140	196	87	141	195
10/	280	290	300	278	288	298	281	291	301
11/	990	993	995	1000	1003	1005	1015	1018	1020
12/	380	391	401	389	400	410	395	406	416
13/	455	520	585	459	526	592	466	534	601
14/	884	887	890	893	897	900	907	911	914
15/	332	352	372	334	355	376	340	361	382
16/	24	24	24	24	24	24	25	25	25
TOTAL	8843	9229	9608	8936	9331	9717	9079	9474	9862

m - minimum

M - Maximum

s - mean

TABLE II_2 (cont'd.)

GRAMMAR SCHOOLS
(GYMNASIUM)

Academic Year
1974/75

Form	I	II	III	IV
Number of pupils	63 118	53 351	46 192	41 464
Number of classes	2103.9	1778.4	1539.7	1382.1

	Estimate of the required number of teachers		
	m	s	M
1/	1145	1198	1250
2/	1274	1318	1362
3/	658	670	682
4/	409	438	466
5/	568	575	581
6/	774	774	774
7/	492	521	550
8/	265	317	368
9/	88	146	203
10/	290	300	310
11/	1023	1026	1028
12/	392	403	413
13/	471	537	603
14/	912	916	919
15/	337	359	380
16/	25	25	25
TOTAL	9123	9523	9915

m - minimum
M - Maximum
s - mean

TABLE II_3

ESTIMATE OF THE REQUIRED NUMBER OF NEW TEACHERS

GRAMMAR SCHOOLS (GYMNASIUM)	MINIMUM				MAXIMUM				AVERAGE				
	requirements in the period 1964/65-1969/70		requirements in the period 1969/70-1974/75		requirements in the period 1964/65-1969/70		requirements in the period 1969/70-1974/75		requirements in the period 1964/65-1969/70		requirements in the period 1969/70-1974/75		
Subjects	D_{69}	T	D_{74}	T	D_{69}	T	D_{74}	T	D_{69}	T	D_{74}	T	X
1. Mother tongue	343	363	199	219	450	470	218	238	396	416	208	228	4
2. Mathematics	561	636	224	299	651	726	239	314	606	681	231	306	15
3. Physics	275	335	113	173	299	359	118	178	287	347	116	176	12
4. Chemistry	117	172	69	124	173	228	82	137	145	200	76	130	11
5. Biology	230	265	96	131	245	280	97	132	238	272	97	132	7
6. History	218	243	131	156	218	243	131	156	218	243	131	156	5
7. Geography	89	104	93	108	160	175	93	108	124	140	93	108	3
8. Social sciences	-39	-24	46	61	66	81	66	81	14	29	56	71	3
9. Economics and business manag.	92	92	13	13	207	207	37	37	150	149	25	25	0
10. Philosphy, logic, psychology	161	166	50	55	168	187	53	58	172	176	52	56	1
11. Foreign lang.	183	238	180	235	187	242	100	155	185	240	140	195	11
12. Classical lang.	145	160	71	86	168	183	74	89	156	172	73	88	3
13. Technical educ.	247	312	82	147	362	427	105	170	305	369	94	158	13
14. Physical and health education	574	689	159	274	589	704	154	269	581	696	156	272	23
15. Drawing and painting	114	189	59	134	157	232	67	142	136	210	63	138	15
16. Music educ. and music	-68	-38	5	35	-68	-38	5	35	-68	-38	5	35	6
Total	3243	3903	1590	2250	4046	4706	1639	2299	3645	4305	1615	2275	

D_{69} stands for the number of teachers who should enter the teaching profession by 1969/70 because of the increase in the number of pupils, the inherited shortage of teachers and because of the loss of teachers through retirement and death.

D_{74} stands for the number of teachers who should enter the teaching profession in the period 1969/70 - 1974/75. These requirements are the result of the increase in the number of pupils, loss of teachers through death and retirement supposing that D_{69} was achieved.

$$D_{69} = 5\,\frac{P69 - Q^5 B_{64}}{S}$$

P_{69} = teacher requirements in 1969
Q = factor of the losses through death and retirement - 97%
B_{64} = number of teachers in 1964
$S = 1 + q + q^2 + q^3 + q^4 = 4.7089$

T = total number of teachers
T = D + 5x
$X = 0.08425\ N_{64}$
D_{74} is analogous to D_{69}
Average = arithmetic mean of minimum and maximum

TABLE III_1

ESTIMATE OF THE NUMBER OF TEACHERS FOR PARTICULAR SUBJECTS IN 1964/65

SECONDARY TECHNICAL SCHOOLS
TAKEN TOGETHER

Subjects	Ai	Fi	Xi	Ui	Yi	Bi,64	Ci	Bi,64	Zi	Ni,64
1. Mother tongue	292	4302	15.61	355	13.77	336	78	414	10	41
2. Foreign language	277	3083	11.19	255	9.89	241	56	297	15	45
3. History	140	1654	6.00	137	5.31	130	30	160	24	38
4. Geography	67	658	2.39	54	2.09	51	12	63	16	10
5. Social sciences	68	814	2.95	67	2.60	63	15	78	28	22
6. Economics and business management	2	17	0.06	1	0.04	1	0	1	0	0
7. Physical and health educ.	45	805	-	45	1.75	43	10	53	84	45
8. Mathematics	452	6103	22.15	504	19.55	477	111	588	41	241
9. Physics	201	1834	6.66	152	5.90	144	34	178	45	80
10. Chemistry	128	1254	4.55	104	4.03	98	23	121	52	63
11. Hygiene - nursing	10	55	-	10	0.39	9	2	11	80	9
12. Practical training	248	5622	-	248	9.62	235	55	290	56	162
13. Technical and theoretical subjects	739	7709	27.98	636	24.67	602	142	744	56	417
14. Other subjects	17	123	0.45	10	0.39	9	2	11		
	2586	34033	99.99	2578	100.00	2439	570	3009		1173

$F = \sum F_i - F_7 - F_{11} - F_{12} = 27551$

$U = 2578$
$U_p = 2275$

$B_{,64} =$ 2439 (Bulletin no. 355)

C = 570 (C stands for the estimated number of teachers in school centres in 1964/65)
Zi % Ai = Ni,62 (Ni,62 stands for the number of untrained teachers of the subjects "i")
Zi % B_i,64 = Ni,64

NOTA BENE : Teachers for the group of subjects civil engineering in civil engineering type of secondary technical schools were not recorded in 1962 census of teachers. Hence such a great shortage of teachers for technical and theoretical subjects.

(Only geography was excluded from the group of subjects social sciences).

TABLE III_2

ACADEMIC YEAR

SECONDARY TECHNICAL SCHOOLS TAKEN TOGETHER	1965 - 66				1966 - 67				1967 - 68			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	30738	23295	18176	15332	32815	25378	20256	16120	35216	27077	22057	17956
Number of classes	1024.5	776.4	605.8	511.0	1093.7	845.8	675.1	537.3	1173.7	902.5	735.2	598.5

	Estimate of the required number of teachers								
	m	s	M	m	s	M	m	s	M
1. Mother tongue	398	398	398	429	429	429	466	466	466
2. Foreign language	265	317	369	286	343	400	309	371	433
3. History	96	148	201	102	160	217	108	171	233
4. Geography	0	67	133	0	73	146	0	78	157
5. Social sciences	5	38	71	5	41	77	6	46	85
6. Economics and business manag.	34	116	199	37	127	217	42	140	238
7. Physical and health educ.	265	265	265	286	286	286	309	309	309
8. Mathematics	534	637	740	574	685	797	615	736	857
9. Physics	136	192	248	144	207	269	155	222	289
10.Chemistry	56	70	84	60	74	89	64	80	96
11.Hygiene-nursing	0	18	35	0	19	37	0	20	40
12.Practical training	100	318	535	108	343	579	117	372	627
13.Technical and theoretical subjects	1708 /1479/	2456 /2123/	3205 /2761/	1840 /1593/	2657 /2294/	3473 /2991/	1992 /1733/	2881 /2489/	3771 /3248/
Total	3596 /3367/	5040 /4707/	6483 /6039/	3871 /1624/	5444 /5081/	7016 /6534/	4183 /3924/	5892 /5500/	7601 /7078/

s - mean
m - minimum
M - maximum

TABLE III_2 (cont'd)

SECONDARY TECHNICAL SCHOOLS TAKEN TOGETHER	ACADEMIC YEAR 1968 - 69				1969 - 70				1970 - 71			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	36366	28394	22994	19102	37265	31477	26229	21244	38320	31850	28509	24234
Number of classes	1212.1	946.4	766.4	636.7	1242.0	1049.1	874.2	708.1	1277.2	1061.6	950.2	807.7

	Estimate of the required number of teachers								
	1968 - 69			1969 - 70			1970 - 71		
	m	s	M	m	s	M	m	s	M
1. Mother tongue	484	484	484	528	528	528	558	558	558
2. Foreign lang.	323	387	450	351	421	490	372	445	518
3. History	113	177	242	121	189	257	124	195	267
4. Geography	0	81	162	0	86	172	0	89	177
5. Social sciences	6	47	88	6	52	98	7	57	107
6. Economics and business man.	43	147	250	49	163	277	53	176	300
7. Physical and health educ.	323	323	323	351	351	351	372	372	372
8. Mathematics	641	766	892	689	824	959	715	859	1002
9. Physics	160	230	299	166	240	314	170	246	323
10. Chemistry	66	82	99	68	84	101	70	88	105
11. Hygiene-nursing	0	20	41	0	23	45	0	24	48
12. Practical training	122	389	656	131	423	715	135	444	753
13. Technical and theoretical subjects	2081 /1801/	3015 /2564/	3949 /3400/	2276 /1970/	3309 /2858/	4342 /3739/	2430 /2203/	3536 /3053/	4643 /3997/
TOTAL	4362 /4082/	6148 /5697/	7935 /7386/	4736 /4430/	6693 /6242/	8649 /8046/	5006 /4779/	7089 /6606/	9173 /8527/

s - mean
m - minimum
M - maximum

TABLE III$_2$ (cont'd)

SECONDARY TECHNICAL SCHOOLS TAKEN TOGETHER	ACADEMIC YEAR 1971 - 72				1972 - 73				1973 - 74				1974 - 75			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	43792	[illegible]	[illegible]	26333	[illegible]	[illegible]	29662	26652	51913	40062	33897	27407	55039	44369	36282	31321
Number of classes	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	988.6	888.3	1730.3	1335.3	1129.8	913.5	[illegible]	1478'8	1209'3	1043'9

[illegible] of the required number of teachers

	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	599	599	599	640	640	640	696	696	696	759	759	759
2. Foreign language	398	477	555	426	510	595	465	557	649	516	592	668
3. History	131	210	289	148	231	314	161	253	346	174	274	373
4. Geography	0	97	195	0	112	223	0	119	237	0	128	256
5. Social sciences	7	61	114	7	62	117	8	68	128	9	75	141
6. Economics and business manag.	53	183	314	54	190	326	60	208	356	56	221	387
7. Physical and health education	398	398	398	426	426	426	465	465	465	506	506	506
8. Mathematics	772	934	1096	840	1004	1169	920	1102	1283	996	1194	1391
9. Physics	191	275	359	205	257	309	226	327	429	243	352	462
10. Chemistry	80	101	121	87	109	130	97	122	146	104	130	156
11. Hygiene-nursing	0	24	49	0	27	55	0	30	60	0	33	65
12. Practical training	144	474	803	156	506	856	166	548	930	180	596	1012
13. Technical and theoretical subjects	2600 /2250/	3767 /3251/	4934 /4248/	2761 /2389/	4000 /3451/	5239 /4512/	2997 /2594/	4348 /3752/	5700 /4908/	3282 /2840/	4765 /4106/	6249 /5379/
Total	5373 /5023/	7600 /7084/	9826 /9140/	5750 /5378/	8074 /7525/	10399 /9672/	6261 /5858/	8843 /8247/	11425 /10633/	6825 /6383/	9625 /8966/	12425 /11555/

s - mean
m - minimum
M - maximum

TABLE III$_3$

ESTIMATE OF THE REQUIRED NUMBER OF NEW TEACHERS FOR THE PERIOD 1964/65 - 1969/70 (D_{69}) AND 1969/70 - 1974/75 (D_{74})

SECONDARY TECHNICAL SCHOOLS TAKEN TOGETHER	Minimum				Maximum				Average				
Subjects	D_{69}	Total	D_{74}	Total	D_{69}	Total	D_{74}	Total	D_{69}	Total	D_{74}	Total	X
1. Mother tongue	183	198	324	339	183	198	324	339	183	198	324	339	3
2. Foreign lang.	102	122	228	248	249	269	262	282	175	195	245	265	4
3. History	17	- 2	74	89	127	142	162	177	55	70	118	133	3
4. Geography	57	-52	0	5	125	130	115	120	34	39	57	62	1
5. Social sciences	65	-55	4	14	33	43	60	70	- 16	- 6	32	42	2
6. Economics and business man.	51	51	15	15	293	293	158	158	172	172	87	87	0
7. Physical and health educ.	324	344	217	237	324	344	217	237	324	344	217	237	4
8. Mathematics	195	295	429	529	482	582	602	702	339	439	515	615	20
9. Physics	14	49	107	142	171	206	204	239	92	127	156	191	7
10. Chemistry	- 38	- 13	48	73	- 3	22	74	99	- 21	5	61	86	5
11. Hygiene nurs.	- 10	- 5	0	5	38	43	28	33	14	19	14	19	1
12. Practical training	-125	- 55	72	142	495	565	422	492	185	255	247	317	14
13. Technical and theoretical subjects	1413	1588	1219	1394	3292	2567	2302	2477	2353	2077	1761	1936	35
Total	1970	2465	2737	3232	5809	5404	4930	5425	3889	3934	3834	4329	

D_{69} represents the required number of teachers who should enter the teaching profession (or stop teaching) by 1969/70

D_{74} is analogus to D_{69} for the period 1969/70-1974/75

Total = D_{69}+ 5x is the number of teachers who should enter the teaching profession (or stop teaching). It is the result of the increase in the number of pupils, shortage of teachers resulting from retirement or death and substitution of untrained teachers by the trained ones.

X = 0.084 Ni,64 (Ni,64 stands for the number of untrained teachers in 1964)

TABLE III A_2

SECONDARY TECHNICAL SCHOOLS MECHANICAL-ENGINEERING	Academic Year 1965/66				1966/67				1967/68			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	9384	7112	5549	4681	10091	7804	6225	4957	10823	8322	6779	5519
Number of classes	312.8	237.1	185.0	156.0	336.4	260.1	207.5	165.2	360.8	277.4	226.0	184.0

Estimate of the required number of teachers

	1965/66 m	1965/66 s	1965/66 M	1966/67 m	1966/67 s	1966/67 M	1967/68 m	1967/68 s	1967/68 M
1. Mother tongue	121	121	121	132	132	132	143	143	143
2. Foreign language	81	101	121	88	110	132	95	119	143
3. History	22	45	67	24	49	73	25	52	79
4. Geography	0	32	64	0	35	69	0	37	74
5. Social sciences	0	16	31	0	17	34	0	19	37
6. Economics and business manag.	0	23	46	0	26	51	0	28	56
7. Physical and health education	81	81	81	88	88	88	95	95	95
8. Mathematics	164	207	249	179	225	270	192	242	291
9. Physics	28	60	92	30	65	100	33	70	107
10. Chemistry	28	36	43	31	39	46	33	41	49
11. Technical and theoretical subjects (85%)	661 /562/	805 /684/	947 /805/	720 /612/	876 /745/	1030 /875/	780 /663/	949 /807/	1117 /949/
12. Hygiene - nursing	0	6	11	0	6	12	0	7	13
13. Practical training	9	83	156	10	90	170	11	98	184
Total	1195 /1096/	1616 /1495/	2029 /1887/	1302 /1194/	1758 /1627/	2207 /2052/	1407 /1290/	1900 /1758/	2388 /2220/

NOTA BENE: Technical and theoretical subjects include: electrical engineering - power current, civil engineering, mechanical engineering, mining engineering and geology.

s - mean
m - minimum
M - maximum

TABLE III A_2 (Cont'd)

SECONDARY TECHNICAL
SCHOOLS
MECHANICAL-ENGINEERING

	Academic Year											
	1968/69				1969/70				1970/71			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	11177	8726	7067	5871	11453	9674	8061	6529	11866	9862	8829	7501
Number of classes	372 6	290.9	235.6	195.7	381.7	322.5	268.7	217.6	395.5	328.7	294.3	250.0

	Estimate of the required number of teachers								
	1968/69			1969/70			1970/71		
	m	s	M	m	s	M	m	s	M
1. Mother tongue	149	149	149	162	162	162	173	173	173
2. Foreign language	99	124	149	108	135	162	115	144	173
3. History	27	55	82	30	59	88	30	62	93
4. Geography	0	39	77	0	41	81	0	42	84
5. Social sciences	0	20	39	0	22	44	0	25	49
6. Economics and business manag.	0	30	59	0	33	66	0	37	74
7. Physical and health education	99	99	99	108	108	108	115	115	115
8. Mathematics	200	252	303	214	270	325	223	282	341
9. Physics	34	73	111	34	75	116	36	78	119
10. Chemistry	34	43	51	35	44	52	36	45	54
11. Technical and theoretical subjects (85%)	816 /694/	995 /846/	1172 / 996/	894 /760/	1091 / 927/	1288 /1095/	961 / 817/	1177 /1000/	1392 /1183/
12. Hygiene nursing	0	7	13	0	8	15	0	8	15
13. Practical training	12	103	193	13	113	212	15	122	228
Total	1470 /1348/	1989 /1840/	2497 /2321/	1598 /1464/	2161 /1997/	2719 /2526/	1704 /1560/	2310 /2133/	2910 /2701/

NOTA BENE: Technical and theoretical subjects include: electrical engineering - power current, civil engineering, mechanical engineering mining engineering and geology.

s - mean
m - minimum
M - maximum

TABLE III A_2 (Cont'd)

SECONDARY TECHNICAL SCHOOLS MECHANICAL-ENGINNERING	Academic Year											
	1971/72				1972/73				1973/74			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	13660	10216	8998	8216	14728	11761	9320	8375	16431	12680	10729	8679
Number of classes	455.3	340.5	299.9	273.9	490.9	392.0	310.7	279.2	547.7	422.7	357.6	289.2

	Estimate of the required number of teachers								
	1971/72			1972/73			1973/74		
	m	s	M	m	s	M	m	s	M
1. Mother tongue	187	187	187	201	201	201	220	220	220
2. Foreign language	124	155	186	134	167	200	147	184	220
3. History	31	66	100	36	72	108	39	80	121
4. Geography	0	47	93	0	51	102	0	57	113
5. Social sciences	0	26	52	0	27	53	0	30	59
6. Economics and business manag.	0	39	78	0	40	80	0	44	88
7. Physical and health education	124	124	124	134	134	134	147	147	147
8. Mathematics	242	307	372	265	334	403	294	370	446
9. Physics	41	88	134	44	95	146	49	106	162
10. Chemistry	41	52	62	45	56	67	50	63	75
11. Technical and theoretical subjects (85%)	1031 /876/	1262 /1073/	1491 /1267/	1104 /938/	1347 /1145/	1589 /1351/	1207 /1026/	1471 /1250/	1734 /1474/
12. Hygiene-nursing	0	8	15	0	9	18	0	10	19
13. Practical training	16	131	245	17	140	262	17	151	285
Total	1837 /1682/	2492 /2303/	3139 /2915/	1980 /1814/	2673 /2471/	3363 /3125/	2170 /1989/	2933 /2712/	3689 /3429/

NOTA BENE: Technical and theoretical subjects include: electrical engineering - power current, civil engineering, mechanical engineering, mining engineering and geology.

s - mean
m - minimum
M - maximum

TABLE III A_2 (Cont'd)

SECONDARY TECHNICAL
SCHOOLS

Academic Year

MECHANICAL-ENGINNEERING

1974/75

Form	I	II	III	IV
Number of pupils	17547	14145	11567	9985
Number of classes	584.9	471.5	385.6	332.8

Estimate of the required number of teachers

	m	s	M
1. Mother tongue	242	242	242
2. Foreign language	161	201	241
3. History	43	87	131
4. Geography	0	61	122
5. Social sciences	0	33	65
6. Economics and business management	0	49	98
7. Physical and health education	161	161	161
8. Mathematics	319	402	485
9. Physics	53	114	175
10. Chemistry	53	67	80
11. Technical and theoretical subjects (85%)	1332 /1132/	1626 /1382/	1918 /1630/
12. Hygiene - nursing	0	11	21
13. Practical training	20	168	315
Total	2384 /2184/	3222 /2978/	4054 /3766/

NOTA BENE: Technical and theoretical subjects include: electrical engineering - power current, civil engineering, mechanical engineering, mining engineering and geology.

s - mean
m - minimum
M - maximum

TABLE III B_2

SECONDARY TECH-
NICAL SCHOOLS

ELECTRICAL-
ENGINEERING

	Academic Year 1965/66				1966/67				1967/68				1968/69			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	3842	2912	2272	1916	4237	3277	2615	2081	4604	3540	2884	2347	4754	3712	3006	2497
Number of classes	128.1	97.1	75.7	63.9	141.2	109.2	87.2	69.4	153.5	118.0	96.1	78.2	158.5	123.7	100.2	83.2

Estimate of the required

	1965/66			1966/67			1967/68			1968/69		
	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	50	50	50	55	55	55	61	61	61	63	63	63
2. Foreign language	33	42	50	37	46	55	40	51	61	42	53	63
3. History	9	17	25	10	19	28	11	21	30	11	21	31
4. Geography	0	13	26	0	15	29	0	16	32	0	17	33
5. Social sciences	0	4	7	0	4	8	0	5	9	0	5	9
6. Economics and business management	0	10	19	0	11	21	0	12	24	0	13	25
7. Physical and health education	33	33	33	37	37	37	40	40	40	42	42	42
8. Mathematics	62	75	87	69	83	97	75	91	106	78	94	110
9. Physics	12	24	36	13	28	42	14	30	46	14	31	48
10. Chemistry	12	15	17	13	16	19	14	18	21	14	18	22
11. Technical and theoretical subjects (85 %)	124 /105/	342 /291/	560 /476/	137 /116/	382 /325/	627 /533/	150 /127/	420 /357/	688 /585/	155 /132/	393 /334/	722 /614/
12. Hygiene-nursing	0	3	6	0	3	6	0	4	7	0	4	7
13. Practical training	0	26	51	0	29	57	0	31	62	0	33	65
Total	335 /316/	654 /603/	967 /883/	371 /350/	728 /671/	1081 /987/	405 /382/	800 /737/	1187 /1084/	419 /396/	787 /728/	1240 /1132/

Nota bene: Technical and theoretical subjects include: electrical engineering low tension current, mechanical engineering and electrical engineering - power current

s - mean
m - minimum
M - maximum

TABLE III B_2 (Cont'd)

SECONDARY TECHNICAL SCHOOLS

ELECTRICAL-ENGINEERING

Academic Year

	1969/70				1970/71				1971/72				1972/73			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	4872	4115	3429	2777	5097	4237	3792	3225	5926	4432	3904	3564	6450	5151	4082	3668
Number of classes	162.4	137.2	114.3	92.6	169.9	141.2	126.4	107.5	197.5	147.7	130.1	118.8	215.0	171.7	136.1	122.3

Estimate of the required number of teacher

	1969/70			1970/71			1971/72			1972/73		
	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	69	69	69	74	74	74	81	81	81	88	88	88
2. Foreign language	46	58	69	49	62	74	54	68	81	59	74	88
3. History	12	23	33	13	24	35	13	26	38	16	30	43
4. Geography	0	18	35	0	18	36	0	20	40	0	27	53
5. Social sciences	0	5	10	0	6	11	0	6	12	0	6	12
6. Economics and business manag.	0	14	28	0	16	32	0	17	34	0	18	35
7. Physical and health education	46	46	46	49	49	49	54	54	54	59	59	59
8. Mathematics	84	101	118	88	107	125	96	117	138	106	129	151
9. Physics	15	33	51	15	35	54	18	39	59	19	42	65
10. Chemistry	15	19	22	15	19	23	18	23	27	19	24	29
11. Technical and theoretical subjects (85%)	165 /140/	483 /411/	799 /679/	173 /147/	523 /445/	870 /739/	193 /164/	565 /480/	934 /794/	214 /182/	611 /519/	1007 /856/
12. Hygiene-nursing	0	4	7	0	4	8	0	5	9	0	5	10
13. Practical training	0	35	70	0	38	75	0	41	82	0	45	89
Total	452 /427/	908 /836/	1357 /1237/	476 /450/	975 /897/	1466 /1335/	527 /498/	1062 /977/	1589 /1449/	580 /548/	1158 /1066/	1729 /1578/

NOTA BENE: Technical and theoretical subjects include: electrical engineering - low tension current, mechanical engineering and electrical engineering - power current

s - mean
m - minimum
M - maximum

Tableau III B_2 (cont'd)

SECONDARY TECHNICAL SCHOOLS

Academic Year

ELECTRICAL-ENGINEERING

	1973/74				1974/75			
Form	I	II	III	IV	I	II	III	IV
Number of Pupils	7263	5605	4743	3834	7827	6309	5159	4454
Number of classes	242.1	186.8	158.1	127.8	260.9	210.3	172.0	148.5

Estimate of the required number of teachers

	1973/74			1974/75		
	m	s	M	m	s	M
1. Mother tongue	97	97	97	108	108	108
2. Foreign language	65	81	97	72	90	108
3. History	17	32	47	19	36	52
4. Geography	0	25	50	0	28	55
5. Social Sciences	0	7	14	0	8	16
6. Economics and business manag.	0	20	39	0	22	44
7. Physical and health education	65	65	65	72	72	72
8. Mathematics	119	144	168	130	158	185
9. Physics	22	48	73	24	52	80
10. Chemistry	22	28	33	24	30	36
11. Technical and theoretical subjects (85 %)	236 /201/	674 /573/	1111 /944/	260 /221/	751 /638/	1240 /1054/
12. Hygiene-nursing	0	6	11	0	6	12
13. Practical training	0	50	99	0	55	110
Total	643 /608/	1277 /1176/	1904 /1737/	709 /670/	1416 /1303/	2118 /1932/

NOTA BENE : Technical and theoretical subjects include: electrical engineering - low tension current, mechanical engineering and electrical engineering - power current

s - mean
m - minimum
M - maximum

TABLE III C$_2$

SECONDARY TECHNICAL
SCHOOLS
CIVIL-ENGINEERING

Academic Year

	1965/66				1966/67				1967/68				1968/69			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	5172	3920	3058	2580	5392	4170	3328	2649	5654	4347	3541	2883	5839	4559	3692	3067
Number of classes	172.4	130.7	101.9	80.0	179.7	139.0	110.9	88.3	188.5	144.9	118.0	96.1	194.6	152.0	123.1	102.2

Estimate of the required number of teachers

	1965/66			1966/67			1967/68			1968/69		
	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	67	67	67	71	71	71	75	75	75	78	78	78
2. Foreign language	45	62	78	47	65	82	50	68	87	52	71	90
3. History	28	34	41	29	36	43	30	38	45	31	39	47
4. Geography	0	14	28	0	14	29	0	15	30	0	15	31
5. Social sciences	0	4	8	0	4	8	0	4	9	0	5	9
6. Economics and business manag.	9	12	14	10	13	15	11	14	16	11	14	17
7. Physical and education	45	45	45	47	47	47	50	50	50	52	52	52
8. Mathematics	146	167	188	153	175	198	161	185	209	168	192	217
9. Physics	35	35	35	37	37	37	39	39	39	40	40	40
10. Chemistry	16	20	24	16	20	24	17	21	26	18	22	26
11. Technical and theoretical subjects (93%)	341 /317/	404 /376/	465 /432/	360 /335/	426 /396/	491 /457/	382 /355/	452 /420/	521 /485/	401 /373/	474 /441/	546 /508/
12. Hygiene-nursing	0	5	11	0	5	11	0	6	12	0	6	12
13. Practical training	0	25	49	0	26	52	0	28	55	0	28	57
Total	732 /708/	894 /866/	1053 /1020/	770 /745/	939 /909/	1108 /1074/	815 /788/	995 /963/	1174 /1138/	851 /823/	1036 /1003/	1222 /1184/

NOTA BENE: The group of technical and theoretical subjects includes applied art and civil engineering.

s – mean
m – minimum
M – maximum

TABLE III C_2 (cont'd)

SECONDARY TECHNICAL SCHOOLS CIVIL-ENGINEERING	Academic Year 1969/70				1970/71				1971/72				1972/73			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	5983	5054	4211	3411	6152	5114	4577	3891	7031	5258	4631	4229	7526	6009	4762	4279
Number of classes	199.4	168.5	140.4	113.7	205.1	170.5	152.6	129.5	234.4	175.3	154.4	141.0	250.9	200.9	158.7	142.6

Estimate of the required number of teachers

	1969/70			1970/71			1971/72			1972/73		
	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	85	85	85	90	90	90	96	96	96	103	103	103
2. Foreign language	56	77	98	60	81	102	64	87	109	68	94	119
3. History	33	42	50	34	43	51	37	46	56	41	51	61
4. Geography	0	16	33	0	17	34	0	19	37	0	20	41
5. Social sciences	0	5	10	0	6	12	0	6	13	0	7	13
6. Economics and business manag.	13	16	19	14	17	21	14	18	21	14	18	22
7. Physical and education	56	56	56	60	60	60	64	64	64	68	68	68
8. Mathematics	180	207	233	186	214	242	201	231	262	219	251	283
9. Physics	42	42	42	43	43	43	48	48	48	52	52	52
10. Chemistry	18	22	27	19	24	28	21	27	32	23	28	34
11. Technical and theoretical subjects (93%)	441 /410/	521 /485/	600 /558/	473 /440/	558 /519/	643 /598/	504 /469/	593 /551/	683 /635/	531 /494/	626 /582/	721 /671
12. Hygiene-nursing	0	7	14	0	7	15	0	8	15	0	8	16
13. Practical training	0	31	62	0	32	64	0	34	68	0	37	74
Total	924 /893/	1127 /1091/	1329 /1287/	979 /946/	1192 /1153/	1405 /1369/	1049 /1014/	1277 /1235/	1504 /1456/	1119 /1082/	1363 /1319/	1607 /1557

NOTA BENE: The group of technical and theoretical subjects includes applied art and civil engineering.

s - mean
m - minimum
M - maximum

TABLE III C_2 (cont'd.)

SECONDARY TECHNICAL SCHOOLS

CIVIL - ENGINEERING

	Academic Year 1973/74				1974/75			
Form	I	II	III	IV	I	II	III	IV
Number of pupils	8335	6432	5442	4400	8836	7124	5825	5029
Number of classes	277.8	214.4	181.4	146.7	294.5	237.5	194.2	167.6

	Estimate of the required number of teachers					
	m	s	M	m	s	M
1. Mother tongue	112	112	112	122	122	122
2. Foreign language	75	102	129	81	111	140
3. History	45	56	67	48	60	72
4. Geography	0	22	45	0	24	48
5. Social sciences	0	7	13	0	7	15
6. Economics and business manag.	16	20	25	18	22	26
7. Physical and health education	75	75	75	81	81	81
8. Mathematics	239	275	310	259	298	336
9. Physics	57	57	57	62	62	62
10. Chemistry	25	31	38	27	33	40
11. Technical and theoretical subjects (93%)	576 /536/	681 /633/	785 /730/	632 /588/	746 /694/	860 /800/
12. Hygiene-nursing	0	9	18	0	10	20
13. Practical training	0	41	82	0	44	88
TOTAL	1220 /1180/	1488 /1440/	1756 /1701/	1330 /1286/	1620 /1568/	1910 /1850/

NOTA BENE : The group of technical and theoretical subjects includes applied art and civil engineering.

s - mean

m - minimum

M - maximum

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TABLE III D_2

Academic Year

SECONDARY TECHNICAL SCHOOLS TECHNOLOGICAL	1965/66				1966/67				1967/68				1968/69			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	2217	1680	1311	1106	2311	1787	1427	1135	2423	1863	1518	1235	2502	1954	1582	1314
Number of classes	73.9	56.0	43.7	36.9	77.0	59.6	47.6	37.8	80.8	62.1	50.6	41.2	83.4	65.1	52.7	43.8

Estimate of the required number of teachers

	1965/66			1966/67			1967/68			1968/69		
	m	s	M	s	s	M	m	s	M	m	s	M
1. Mother tongue	29	29	29	30	30	30	32	32	32	33	33	33
2. Foreign language	19	19	19	20	20	20	21	21	21	22	22	22
3. History	13	13	13	14	14	14	15	15	15	15	15	15
4. Economics and business management	5	8	11	5	9	12	6	9	12	6	10	13
5. Physical and health education	19	19	19	20	20	20	21	21	21	22	22	22
6. Mathematics	39	39	39	41	41	41	43	43	43	45	45	45
7. Physics	19	19	19	19	19	19	20	20	20	21	21	21
8. Technical and theoretical subj. (85%)	142 /121/	174 /148/	204 /173/	149 /127/	182 /155/	215 /183/	159 /135/	195 /166/	229 /195/	165 /140/	202 /172/	238 /202/
9. Practical training	4	14	23	5	15	24	5	15	25	5	16	26
TOTAL	289 /268/	334 /308/	376 /345/	303 /281/	350 /323/	395 /363/	322 /298/	371 /342/	418 /384/	334 /309/	386 /356/	435 /399/

NOTA BENE: The group of technical and theoretical subjects comprises chemistry, mechanical-engineering, electrical engineering, power current.

s - mean

m - minimum

M - Maximum

TABLE III D_2 (cont'd)

Academic Years

SECONDARY TECHNICAL SCHOOLS

TECHNOLOGICAL

	1969/70				1970/71				1971/72				1972/73			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils*	2564	2166	1805	1462	2637	2191	1961	1668	3013	2254	1985	1812	3225	2575	2041	1834
Number of classes	85.5	72.2	60.2	48.7	87.9	73.0	65.4	55.6	100.4	75.1	66.2	60.4	107.5	85.8	68.0	61.1

Estimate of the required number of teachers

	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	36	36	36	38	38	38	41	41	41	44	44	44
2. Foreign language	24	24	24	26	26	26	27	27	27	29	29	29
3. History	15	15	15	16	16	16	18	18	18	19	19	19
4. Economics and business manag.	7	11	15	8	12	16	8	13	17	8	13	18
5. Physical and health education	24	24	24	26	26	26	27	27	27	29	29	29
6. Mathematics	49	49	49	52	52	52	56	56	56	60	60	60
7. Physics	22	22	22	23	23	23	25	25	25	27	27	27
8. Technical and theoretical subj. (85%)	181 /154/	222 /189/	261 /222/	192 /163/	235 /200/	277 /235/	206 /175/	251 /213/	294 /250/	219 /186/	267 /227/	314 /267/
9. Practical training	5	17	29	5	18	30	6	19	32	7	21	34
TOTAL	363 /396/	420 /387/	475 /436/	386 /357/	446 /411/	504 /462/	414 /383/	477 /439/	537 /493/	442 /409/	509 /469/	574 /527/

NOTA BENE: The group of technical and theoretical subjects comprises chemistry, mechanical-engineering, electrical engineering-power current.

s - mean

m - minimum

M - Maximum

TABLE III D_2 (Cont'd)

SECONDARY TECHNICAL
SCHOOLS

Academic Years

TECHNOLOGICAL

	1973/74				1974/75			
Form	I	II	III	IV	I	II	III	IV
Number of pupils	3572	2737	2332	1886	3787	3053	2497	2155
Number of classes	119.1	91.9	77.7	62.9	126.2	101.8	83.2	71.8

Estimate of the required number of teachers

	1973/74			1974/75		
	m	s	M	m	s	M
1. Mother tongue	48	48	48	52	52	52
2. Foreign language	32	32	32	35	35	35
3. History	22	22	22	23	23	23
4. Economics and business manag.	9	14	19	10	16	21
5. Physical and health education	32	32	32	35	35	35
6. Mathematics	65	65	65	71	71	71
7. Physics	30	30	30	32	32	32
8. Technical and theoretical subj. (85 %)	238 /202/	291 /247/	343 /292/	259 /220/	317 /269/	374 /317/
9. Practical training	7	23	38	8	25	41
Total	483 /447/	557 /513/	629 /578/	525 /486/	606 /558	684 /627/

NOTA BENE: The group of technical and theoretical subjects comprises chemistry, mechanical-engineering, electrical engineering - power current.

TABLE III E_2

A c a d e m i c Y e a r

SECONDARY TECHNICAL SCHOOLS

OTHER TYPES	1965/66				1966/67				1967/68				1968/69			
F o r m	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	10123	7671	5986	5049	10784	8340	6657	5298	11712	9005	7335	5972	12094	9443	7647	6353
Number of classes	337.4	255.7	199.5	168.3	359.5	278.0	221.9	176.6	390.4	300.2	244.5	199.1	403.1	314.8	254.9	211.8

Estimated of the required number of teachers

	1965/66			1966/67			1967/68			1968/69		
	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	131	131	131	141	141	141	155	155	155	161	161	161
2. Foreign language	87	94	101	94	103	111	103	112	121	108	117	126
3. History	23	39	55	25	42	59	27	46	64	29	48	67
4. Geography	0	8	15	0	10	19	0	11	21	0	11	21
5. Social sciences	5	15	25	5	16	27	6	18	30	6	19	31
6. Economics and business manag.	20	64	109	22	70	118	25	78	130	26	81	136
7. Phylosophy, log., psychology	0	1	1	0	1	1	0	1	1	0	1	1
8. Mathematics	123	150	177	132	162	191	144	176	208	150	184	217
9. Physics	42	54	66	45	58	71	49	63	77	51	65	79
10. Physical and health educ.	87	87	87	94	94	94	103	103	103	108	108	108
11. Hygiene nursing	0	3	7	0	4	8	0	4	8	0	5	9
12. Practical training	87	172	256	93	185	276	101	201	301	105	210	315
13. Technical and theoretical subjects	440 /374/	734 /624/	1029 /875/	474 /403/	792 /673/	1110 /943/	521 /443/	869 /739/	1216 /1034/	544 /462/	907 /771/	1271 /1080/
T O T A L	1045 /979/	1513 /1403/	2059 /1905/	1125 /1054/	1678 /1559/	2226 /2059/	1234 /1156/	1837 /1707/	2435 /2253/	1288 /1206/	1917 /1781/	2542 /2351/

NOTA BENE : The group of technical and theoretical subjects includes : applied art, chemistry, electrical- engineering, mechanical- engineering, textile technology, civil engineering, mining engineering, geology, forestry and wood technology, leather and rubber technology

s - mean
m - minimum
M - maximum

TABLE III E_2 (cont'd)

Academic Year

SECONDARY TECHNICAL SCHOOLS

OTHER TYPES	1969/70				1970/71				1971/72				1972/73			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	12393	10468	8723	7065	12568	10446	9350	7949	14162	10592	9328	8518	14943	11933	9457	8496
Number of classes	413.1	348.9	290.8	235.5	418.9	348.2	311.7	265.0	472.1	353.1	310.9	283.9	498.1	397.8	315.2	283.2

Estimate of the required number of teachers

	1969/70			1970/71			1971/72			1972/73		
	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	176	176	176	183	183	183	194	194	194	204	204	204
2. Foreign language	117	127	137	122	133	143	129	141	152	136	148	159
3. History	31	51	71	31	52	72	32	55	77	36	60	83
4. Geography	0	12	23	0	12	23	0	13	25	0	14	27
5. Social sciences	6	20	34	7	21	35	7	22	37	7	23	39
6. Economics and business manag.	29	89	149	31	94	157	31	98	164	32	102	171
7. Phylosophy log. psychology	0	1	1	0	1	1	0	1	1	0	1	1
8. Mathematics	162	198	234	166	204	242	177	218	258	188	230	272
9. Physics	53	68	83	53	69	84	59	76	93	63	81	99
10. Physical and health educ.	117	117	117	122	122	122	129	129	129	136	1 5	136
11. Hygiene nursing	0	5	9	0	5	10	0	5	10	0	6	11
12. Practical training	113	228	342	115	236	356	122	249	376	132	265	397
13. Technical and theoretical subjetcs	595 /506/	995 /846/	1394 /1185/	631 /536/	1046 /889/	1461 /1242/	666 /566/	1099 /934/	1532 /1302/	693 /589/	1151 /978/	1608 /1367/
Total	1399 /1310/	2087 /1938/	2769 /2560/	1461 /1366/	2178 /2021/	2889 /2670/	1546 /1446/	2300 /2135/	3048 /2818/	1627 /1523/	2421 /2248/	3207 /2966/

NOTA BENE: The group of technical and theoretical subjects includes: applied art, chemistry electrical-engineering, mechanical-engineering, textile technology, civil engineering, mining-engineering, geology, forestry and wood technology, lesther and rubber technology.

s - mean
m - minimum
M - maximum

TABLE III E_2 (cont'd)

SECONDARY TECHNICAL SCHOOLS

OTHER TYPES

Academic Year

Form	1973/74 I	1973/74 II	1973/74 III	1973/74 IV	1974/75 I	1974/75 II	1974/75 III	1974/75 IV
Number of pupils	16312	12588	10651	8612	17042	13738	11234	9698
Number of classes	543.7	419.6	355.0	287.1	568.1	457.9	374.5	323.3

Estimate of the required number of teachers

	1973/74 m	1973/74 s	1973/74 M	1974/75 m	1974/75 s	1974/75 M
1. Mother tongue	219	219	219	235	235	235
2. Foreign language	146	159	171	157	171	184
3. History	38	64	89	41	68	95
4. Geography	0	15	29	0	16	31
5. Social sciences	8	25	42	9	27	45
6. Economics and business manag.	35	110	185	38	118	198
7. Philosophy, logic, psychology	0	1	1	0	1	1
8. Mathematics	203	249	294	217	266	314
9. Physics	68	88	107	72	93	113
10. Physical and health educ.	146	146	146	157	157	157
11. Hygiene nursing	0	6	12	0	6	12
12. Practical training	142	284	426	152	305	458
13. Technical and theoretical subjects (85%)	740 /629/	1234 /1049/	1727 /1468/	799 /679/	1329 /1130/	1857 /1578/
Total	1745 /1634/	2600 /2415/	3448 /3189/	1877 /1757/	2792 /2593/	3700 /3421/

NOTA BENE : The group of technical and theoretical subjects includes: applied art, chemistry electrical-engineering, mechanical-engineering, textile technology, civil engineering, mining-engineering, geology, forestry and wood technology, leather and rubber technology.

s - mean

m - minimum

M - Maximum

TABLE IV_1

ESTIMATE OF THE NUMBER OF TEACHERS FOR PARTICULAR SUBJECTS IN 1964/65.

Agricultural, Forestry
and Veterinary schools

subjects	Ai	Si	Fi	Ki	Ui	Yi	$Bi,_{64}$	Zi	$Ni,_{64}$
1. Mother tongue	115	13.3	1529.5	27.42	166	21.20	123	31.30	38
2. Foreign language	78	10.0	781.9	14.02	85	10.85	62	41.03	25
3. Geography	16	5.8	92.8	1.66	10	1.28	7	37.50	3
4. History	41	10.3	422.3	7.57	46	5.87	34	39.02	13
5. Social sciences	8	0.6	4.9	0.09	1	0.13	1	-	-
6. Economics and business manag.	0	0.0	0.0	0.00	0	0.00	0	0.00	0
7. Physical and health educ.	36	13.5	486.0	/	36	4.60	26	80.56	21
8. Biology	32	9.3	297.6	5.33	32	4.09	23	21.87	5
9. Mathematics	80	11.9	952.0	17.06	104	13.28	76	72.50	55
10. Physics	31	6.4	198.4	3.56	22	2.81	16	80.64	13
11. Chemistry	60	9.6	573.2	10.27	62	7.92	45	78.33	35
12. Hygiene - nursing	7	2.6	18.2	/	7	0.89	5	71.43	4
13. Technical and theoretical subjects	76	8.4	641.4	11.50	70	8.94	51	48.68	25
14. Practical training	133	14.5	1928.5	/	133	16.99	98	67.67	66
15. Other subjects	10	8.5	85.0	1.52	9	1.15	7		
Total	723		8011.7	100.0	783	100.00	574		

$F = \sum F_i - F\ 12 - F\ 14 = 5579.0$

U = 783 (Bulletin no. 356)
Up = U - U7 - U12 - U14 - 6o7
B_{64} = 574 (Bulletin no. 355)

Yi % B_{64} = Bi,64 (Bi,64 is the number of teachers of subject "i")

Zi % Ai = Ni,62 (Ni,62 is the number of untrained teachers of subject "i")
Zi % Bi,64 = Ni,64

NOTA BENE: Teachers for the group of subjects forestry and wood technology in forestry schools were not recorded in 1962 census of teachers. This fact can partly explain a great shortage of teachers for technical and theoretical subjects.

(History and geography are not included in the group of subjects social sciences).

TABLE IV_2

AGRICULTURAL, FORESTRY AND VETERINARY SCHOOLS	Academic Year 1965/66				1966/67				1967/68				1968/69			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	5911	4480	3495	2949	6162	4766	3804	3027	6462	4968	4047	3295	6673	5210	4219	3505
Number of classes	197·1	149·3	116·5	98·3	205·4	158·9	126·8	100·9	215·4	165·6	134·9	109·8	222·4	173·7	104·6	116·8

Estimate of the required number of teachers

	1965/66			1966/67			1967/68			1968/69		
	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	76	80	84	80	85	89	84	89	94	88	93	98
2. Foreign language	52	59	66	55	63	70	58	66	74	60	69	77
3. Geography	3	4	5	3	4	5	4	5	5	4	5	6
4. History	2	17	31	2	18	33	2	18	34	2	19	36
5. Social sciences	0	31	62	0	33	65	0	34	68	0	36	71
6. Economics and business management	9	16	23	9	17	24	10	18	26	10	19	27
7. Physical and health education	50	50	50	53	53	53	56	56	56	59	59	59
8. Biology	16	30	44	17	32	46	17	33	48	18	34	50
9. Mathematics	52	58	64	55	61	67	57	64	71	60	67	74
10. Physics	4	18	32	4	19	33	4	20	35	4	20	36
11. Chemistry	27	40	53	28	42	56	29	44	59	30	46	61
12. Technical and theoretical subjects	130	173	315	138	237	333	145	250	354	154	264	371
13. Hygiene – nursing	0	1	1	0	1	1	0	1	1	0	1	1
14. Practical training	169	200	230	178	210	242	188	222	256	196	232	267
TOTAL	590	777	1060	622	875	1117	654	920	1181	685	964	1234

NOTA BENE: Technical and theoretical subjects include: mechanical-engineering, geology, civil engineering, agriculture, forestry.

s – mean
m – minimum
M – Maximum

TABLE IV_2 (Cont'd)

Academic Year

AGRICULTURAL,
FORESTRY AND
VETERINARY SCHOOLS

Form	1969/70 I	1969/70 II	1969/70 III	1969/70 IV	1970/71 I	1970/71 II	1970/71 III	1970/71 IV	1971/72 I	1971/72 II	1971/72 III	1971/72 IV
Number of pupils	6838	5776	4813	3898	7031	5844	5231	4447	8035	6009	5293	4833
Number of classes	227.9	192.5	160.4	129.9	234.4	194.8	174.4	148.2	267.8	200.3	176.4	161.1

Estimate of the required number of teachers

	1969/70 m	1969/70 s	1969/70 M	1970/71 m	1970/71 s	1970/71 M	1971/72 m	1971/72 s	1971/72 M
1. Mother tongue	96	101	106	101	107	112	109	115	121
2. Foreign language	65	74	83	69	79	88	74	84	94
3. Geography	4	5	6	4	5	6	4	6	7
4. History	2	20	38	2	21	39	3	23	42
5. Social sciences	0	39	77	0	41	81	0	43	86
6. Economics and business manag.	12	22	31	13	24	34	14	25	36
7. Physical and health educ.	64	64	64	68	68	68	72	72	72
8. Biology	18	35	52	19	36	53	22	41	59
9. Mathematics	64	72	79	65	74	82	71	80	88
10. Physics	4	21	37	4	21	38	5	24	43
11. Chemistry	31	48	64	32	49	66	36	54	72
12. Technical and theoretical subjects	171	291	412	185	315	445	193	332	468
13. Hygiene - nursing	0	1	2	0	1	2	0	1	2
14. Practical training	213	252	291	225	267	308	241	286	331
TOTAL	744	1045	1342	787	1108	1422	844	1186	1521

NOTA BENE: Technical and theoretical subjects include: mechanical-engineering, geology, civil engineering.

s - mean
m - minimum
M - Maximum

TABLE IV$_2$ (Cont'd)

Academic Year

AGRICULTURAL, FORESTRY AND VETERINARY SCHOOLS	1972/73				1973/74				1974/75			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	8601	6867	5443	4890	9525	7351	6220	5028	10099	8141	6657	5747
Number of classes	286·7	228·9	181·4	163·0	317·5	245·0	207·3	167·6	336·6	271·4	221·9	191·6

Estimate of the required number of teachers

	1972/73			1973/74			1974/75		
	m	s	M	m	s	M	m	s	M
1. Mother tongue	116	123	129	126	134	141	138	146	153
2. Foreign language	79	90	101	86	98	110	94	107	120
3. Geography	5	6	7	5	7	8	6	8	9
4. History	3	25	46	3	27	51	3	29	55
5. Social sciences	0	47	94	0	51	102	0	56	111
6. Economics and business management	15	26	37	15	28	40	17	31	44
7. Physical and health educ.	77	77	77	84	84	84	92	92	92
8. Biology	23	44	65	26	49	71	27	52	76
9. Mathematics	78	87	96	85	95	105	92	103	114
10. Physics	5	26	47	6	29	51	6	31	55
11. Chemistry	39	59	79	43	65	87	45	69	93
12. Technical and theoretical subjects	204	350	492	221	380	536	243	417	587
13. Hygiene – nursing	0	1	2	0	1	2	0	1	2
14. Practical training	258	305	352	282	333	384	307	363	418
TOTAL	902	1266	1624	982	1381	1772	1070	1505	1929

NOTA BENE: Technical and theoretical subjects include: mechanical-engineering, geology, civil engineering, agriculture, forestry.

s – mean
m – minimum
M – maximum

TABLE IV_3

ESTIMATE OF THE REQUIRED NUMBER OF NEW TEACHERS FOR THE PERIODS 1964/65 - 1969/70 (D_{69}) AND 1969/70 - 1974/75 (D_{74})

AGRICULTURAL, FORESTRY AND VETERINARY SCHOOLS	Minimum				Maximum				Average				
Subjects	D_{69}	Total	D_{74}	Total	D_{69}	Total	D_{74}	Total	D_{69}	Total	D_{74}	Total	X
1. Mother tongue	-10	5	59	74	0	15	66	81	- 5	10	63	78	3
2. Foreign lang.	12	22	41	51	32	42	50	60	22	32	45	55	2
3. Geography	- 2	- 2	3	3	0	0	4	4	- 1	- 1	2	2	0
4. History	-29	-24	1	6	9	14	24	29	-10	- 5	12	117	1
5. Social sciences	- 1	-	0	-	81	-	48	-	40	-	24	-	-
6. Economics and business manag.	13	13	7	7	33	33	18	18	23	23	13	13	0
7. Physical and health education	44	54	39	49	44	54	39	49	44	54	39	49	2
8. Biology	- 2	- 2	12	12	34	34	33	33	16	16	22	22	0
9. Mathematics	- 1	24	39	64	15	40	49	74	7	32	44	68	5
10. Physics	-10	- 5	3	8	25	30	25	30	8	13	14	19	1
11. Chemistry	- 8	7	20	35	27	42	40	55	9	24	30	45	3
12. Hygiene - nursing	-5	- 5	0	0	- 2	- 2	0	0	- 4	- 4	0	0	0
13. Technical and theoretical subjects	135	145	102	112	391	401	248	258	263	273	175	185	2
14. Practical training	137	167	132	162	220	250	178	208	178	208	155	185	6
Total	273	399	458	583	909	953	822	899	590	675	640	741	

D_{69} stands for the number of teachers who should enter the teaching profession (or stop teaching) by 1969/70

D_{74} is analogous to D_{69} for the period 1969/70 - 1974/75

Total - D_{69} + 5x is number of teachers who should enter the teaching profession (or stop teaching). Its results from the increase in the number of pupils, shortage of teachers caused by death or retirement and from substitution of untrained teachers by the trained ones.

x - 0.084 $Ni,_{64}$ ($Ni,_{64}$ is the number of untrained teachers in 1964)

NOTA BENE: Because of the unreliability of data on social sciences it was not possible to estimate the number of untrained teachers.

TABLE V_1

ESTIMATE OF THE NUMBER OF TEACHERS FOR PARTICULAR SUBJECTS IN 1964/65

SECONDARY BUSINEB SCHOOLS
ADMINISTRATIVE AND SECRETARIAL SCHOOLS

subjects	P65	Xi	Bi,64
1. Mother tongue	379	11.63	341
2. Foreign language	356	10.92	320
3. History	188	5.77	169
4. Geography	2	0.06	2
5. Physical and health education	214	6.63	194
6. Mathematics	329	10.09	294
7. Office management	355	10.89	319
8. Technical and theoretical subjects	1.358	41.66	1.222
9. Practical training	31	0.95	28
10. Social sciences	46	1.41	41
Total	3 260	100.81	2 932

B_{64}= 2932 is the total number of teachers in 1964/65.

P_{65}= 3260 is the total required number of teachers in 1965/66.

Xi % P_{65} = Pi, 65 is the teacher requirements for the subject "i" in 1965/66).

Xi % B_{64} = $B_{i,64}$(Bi,64 is the estimated number of teachers of subject "i" in 1964/65).

TABLE V_2

SECONDARY BUSINESS SCHOOLS ADMINISTRATIVE AND SECRETARIAL SCHOOL	Academic Year											
	1965 - 66				1966 - 67				1967 - 68			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	28 078	21 279	16 603	14 005	28 501	22 042	17 593	14 002	29 078	22 358	18 211	14 826
Number of classes	835.7	633.3	494.1	416.3	858.5	663.9	529.9	421.7	886.5	681.6	555.2	452.0

Estimate of the required number of teachers

	m	s	M	m	s	M	m	s	M
1. Mother tongue	363	379	395	377	394	410	392	409	426
2. Foreign language	283	356	429	294	370	446	305	385	464
3. History	132	188	244	136	196	255	141	202	263
4. Geography	0	2	3	0	2	3	0	2	3
5. Social sciences	0	46	92	0	48	96	0	51	102
6. Physical and health education	216	216	216	225	225	225	234	234	234
7. Mathematics	166	329	492	172	342	512	177	355	532
8. Technical and theoretical subjects (95%)	1154 /1096/	1429 /1358/	1706 /1621/	1189 /1130/	1481 /1392/	1773 /1684/	1240 /1178/	1546 /1469/	1851 /1758/
9. Office management	152	355	558	157	369	581	162	382	603
10. Practical training	0	1	2	0	1	2	0	1	2
TOTAL	2466 /2408/	3302 /3230/	4137 /4052/	2550 /2491/	3428 /3339/	4303 /4214/	2651 /2589/	3567 /3490/	4480 /4387/

NOTA BENE: The group of technical and theoretical subjects comprises economics, business management and law.

s - mean
m - minimum
M - maximum

TABLE V_2 (cont'd)

SECONDARY BUSINESS SCHOOLS
ADMINISTRATIVE AND
SECRETARIAL SCHOOLS

Academic Year

	1968/69				1969/70				1970/71			
FORM	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	30 028	23 444	18 985	15 773	30 770	25 991	21 657	17 541	31 465	26 153	23 408	19 898
Number of classes	926.8	723.6	586.0	486.8	961.6	812.2	676.8	548.2	995 7	827 6	740 8	629 7

Estimate of the required number of teachers

	1968/69			1969/70			1970/71		
	m	s	M	m	s	M	m	s	M
1. Mother tongue	415	433	450	454	474	494	482	503	523
2. Foreign language	323	407	491	353	447	541	373	475	576
3. History	148	213	277	159	231	302	163	239	315
4. Geography	0	2	3	0	2	4	0	2	4
5. Social sciences	0	54	108	0	62	123	0	68	136
6. Physical and health education	248	248	248	273	273	273	290	290	290
7. Mathematics	186	374	562	198	408	617	204	429	654
8. Technical and theoretical subjects (95%)	1313 /1247/	1637 /1555/	1960 /1862/	1455 /1382/	1814 /1723/	2173 /2064/	1558 /1480/	1947 /1850/	2335 /2218/
9. Office management	170	404	637	183	443	703	189	464	739
10. Practical training	0	1	2	0	2	3	0	2	3
TOTAL	2803 /2737/	3773 /3691/	4738 /4640/	3075 /3002/	4156 /4065/	5233 /5124/	3259 /3181/	4419 /4321/	5575 /5458/

NOTA BENE: The group of technical and theoretical subjects comprises economics, business management and law.

s - mean
m - minimum
M - Maximum

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TABLE V_2 (cont'd)

SECONDARY BUSINESS SCHOOLS
ADMINISTRATIVE AND
SECRETARIAL SCHOOLS

Academic Year

	1971/72				1972/73				1973/74			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	35 757	26 743	23 553	21 506	38 058	30 390	24 084	21 638	41 911	32 344	27 367	22 126
Number of classes	1146.1	857.1	754.9	689.3	1235.6	986.7	781.9	702.5	1378.6	1063.9	900.2	727.8

Estimate of the required number of teacher

	1971/72			1972/73			1973/74		
	m	s	M	m	s	M	m	s	M
1. Mother tongue	523	545	566	563	588	612	619	646	672
2. Foreign language	404	513	622	438	553	668	481	608	734
3. History	180	260	340	199	286	373	219	316	413
4. Geography	0	2	4	0	2	4	0	3	5
5. Social sciences	0	72	144	0	75	149	0	82	164
6. Physical and health education	313	313	313	337	337	337	370	370	370
7. Mathematics	226	466	706	250	507	764	275	557	839
8. Technical and theoretical subjects (95%)	1675 /1591/	2094 /1989/	2512 /2386/	1773 /1684/	2228 /2117/	2682 /2548/	1966 /1868/	2452 /2329/	2936 /2789/
9. Office management	208	500	793	230	548	867	253	601	949
10. Practical training	0	2	3	0	2	3	0	2	4
TOTAL	3529 /3445/	4767 /4662/	6003 /5877/	3790 /3701/	5126 /5015/	6459 /6325/	4183 /4085/	5637 /5515/	7086 /6939/

NOTA BENE: The group of technical and theoretical subjects comprises economics, business management and law.

s - mean
m - minimum
M - maximum

TABLE V_2 (cont'd)

SECONDARY BUSINESS SCHOOLS
ADMINISTRATIVE AND
SECRETARIAL SCHOOLS

Academic Year

1974/75

Form	I	II	III	IV
Number of pupils	44 183	35 618	29 126	25 141
Number of classes	1472.8	1187.3	970.9	838.0

	Estimate of the required number of teachers		
	m	s	M
1. Mother tongue	678	708	737
2. Foreign language	527	667	806
3. History	238	344	449
4. Goegraphy	0	3	5
5. Social sciences	0	91	182
6. Physical and health education	406	406	406
7. Mathematics	299	610	920
8. Technical and theoretical subjects (95%)	2164 /2056/	2700 /2565/	3236 /3074/
9. Office management	275	659	1044
10. Practical training	0	2	4
Total	4587 /4479/	6190 /6055/	7789 /7627/

NOTA BENE: The group of technical and theoretical subjects comprises economics, business management and law.

s - mean
m - minimum
M - maximum

TABLE V_3

ESTIMATE OF THE REQUIRED NUMBER OF NEW TEACHERS FOR THE PERIODS 1964/65 - 1969/70 (D_{69}) and 1969/70 - 1974/75 (D_{74})

BUSINESS SCHOOLS ADMINISTRATIVE AND SECRETARIAL SCHOLLS	MINIMUM		MAXIMUM		AVERAGE	
subjects	D_{69}	D_{74}	D_{69}	D_{74}	D_{69}	D_{74}
1. Mother tongue	167	306	214	332	190	319
2. Foreign language	83	238	283	362	183	300
3. History	15	108	167	201	91	154
4. Geography	- 2	0	2	2	0	1
5. Physical and health education	113	182	113	182	113	182
6. Mathematics	- 60	137	385	414	163	275
7. Office management	- 97	125	456	467	179	296
8. Technical and theoretical subjects	353	923	1077	1382	715	1153
9. Practical training	- 26	0	- 43	2	- 35	1
10. Social sciences	- 37	0	93	81	28	41
Total	509	2019	2747	3424	1627	2722

D_{69} is the number of teachers who should enter the teaching profession (or stop teaching) by 1969/70

D_{74} is analogous to D_{69} for the period 1969/70 - 1974/75

TABLE VI_1

ESTIMATE OF THE NUMBER OF TEACHERS FOR PARTICULAR SUBJECTS IN 1964/65

SECONDARY SCHOOLS FOR MEDICAL PERSONNEL

subjects	Ai	Fi	Xi	Ui	Yi	Bi_{64}	Zi	Ni_{64}
1. Mother tongue	98	1087.8	11.36	51	8.16	69	15.3	11
2. Foreign language	114	976.3	10.19	46	7.36	62	19.3	12
3. Latin	21	180.6	1.89	9	1.44	12	4.8	1
4. Geography	19	91.2	0.95	4	0.64	5	36.8	2
5. History	54	394.2	4.12	19	3.04	26	29.6	8
6. Social sciences	-	-	-	-	-	-	-	-
7. Economics and business man.	0	0.0	0.00	0	0.00	0	0.0	0
8. Biology	60	324.0	3.38	15	2.40	20	36.7	7
9. Mathematics	49	379.3	2.92	13	2.08	18	59.2	11
10. Physics	56	296.8	3.10	14	2.24	19	60.7	12
11. Chemistry	82	716.0	7.48	34	5.44	46	58.2	27
12. Physical and Health educ.	23	388.7	-	23	3.68	31	100.0	31
13. Practical training	149	3531.3	-	149	23.84	201	0.0	0
14. Technical and theoretical subjects	351	4999.9	52.21	237	37.93	320	87.7	281
15. Other subjects	23	231.1	2.41	11	1.76	15		
TOTAL	1099	13497.2	100.01	625	100.01	844		403

$F = \sum Fi - F_{12} - F_{13} = 9577.2$

U = 625 (bulletin no.356)

Up = U - U12 - U13 - 453

B_{64} = 844 (bulletin no. 353)

Yi % B_{64} = $B_{i,64}$ (Bi,64 is the number of teachers of subject "i")

Zi % Bi,64 = Ni,64

NOTA BENE: Data on teachers of social science subjects are unrealiable.

TABLE VI_2

Academic Year

SECONDARY SCHOOLS FOR MEDICAL PERSONNEL

	1965/66				1966/67				1967/68				1968/69			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	9162	6944	5418	4570	9552	7387	5696	4692	10016	7701	6273	5107	10343	8075	6539	5433
Number of classes	280.2	212.4	165.7	139.8	294.8	228.0	182.0	144.8	312.0	239.9	195.4	159.1	325.2	253.9	205.6	170.8

Estimate of the required number of teachers

	1965/66			1966/67			1967/68			1968/69		
	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	93	101	109	100	108	116	106	115	124	111	121	130
2. Foreign language	73	80	87	77	85	93	82	91	99	87	95	102
3. Latin	25	25	25	27	27	27	28	28	28	30	30	30
4. Geography	0	11	22	0	12	24	0	12	25	0	13	26
5. History	9	27	45	9	28	47	10	30	50	10	32	53
6. Social sciences	0	9	18	0	10	20	0	11	21	0	11	23
7. Economics and business	0	16	31	0	17	34	0	18	36	0	19	38
8. Biology	35	78	122	37	84	130	40	89	138	41	93	145
9. Mathematics	40	54	67	42	56	71	44	59	75	46	63	79
10. Physics	25	37	49	27	40	52	28	42	55	30	43	57
11. Chemistry	25	84	144	27	90	153	28	95	163	29	100	171
12. Physical and health educ.	73	91	109	77	96	116	82	103	124	87	109	130
13. Practical training	0	109	218	0	117	233	0	125	249	0	132	264
14. Technical and theoretical subjects (50%)	168 (84)	600 (300)	1031 (516)	179 (89)	639 (319)	1099 (549)	191 (96)	603 (342)	1176 (588)	201 (100)	722 (361)	1243 (622)
TOTAL	566 (482)	1322 (1022)	2077 (1562)	602 (512)	1409 (1089)	2215 (1665)	639 (544)	1501 (1160)	2363 (1775)	672 (571)	1583 (1222)	2491 (1870)

NOTA BENE : The group of technical and theoretical subjects comprises medicine - specialities and hygiene - nursing.

s - mean
m - minimum
M - maximum

TABLE VI$_2$ (Cont'd)

SECONDARY SCHOOLS FOR MEDICAL PERSONNEL	Academic Year 1969/70				1970/71				1971/72			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	10598	8952	7460	6042	11074	9205	8237	7004	12856	9616	8468	7733
Number of classes	336.4	284.2	236.8	191.8	354.9	295.0	264.0	224.5	416.0	311.2	274.0	250.3

Estimate of the required number of teachers

	1969/70 m	s	M	1970/71 m	s	M	1971/72 m	s	M
1. Mother tongue	122	133	143	132	144	155	146	158	171
2. Foreign language	35	104	114	103	111	120	114	125	136
3. Latin	31	31	31	32	32	32	38	38	38
4. Geography	0	14	28	0	15	29	0	17	33
5. History	10	33	56	11	35	59	13	39	66
6. Social sciences	0	13	26	0	14	29	0	16	31
7. Economics and business	0	21	43	0	24	47	0	25	50
8. Biology	44	101	159	46	107	169	52	119	186
9. Mathematics	49	67	85	51	70	89	59	79	99
10. Physics	31	46	60	32	47	63	38	55	73
11. Chemistry	30	108	186	32	115	198	37	128	219
12. Physical and health educ.	95	119	143	103	129	155	114	143	171
13. Practical training	0	148	296	0	163	325	0	175	350
14. Technical and theoretical subjects	219	798	1377	239	871	1503	266	955	1645
(50%)	(110)	(399)	(688)	(119)	(435)	(752)	(133)	(478)	(822)
TOTAL	726 (617)	1736 (1337)	2447 (2058)	781 (661)	1877 (1441)	2973 (2222)	877 (744)	2072 (1595)	3268 (2445)

NOTA BENE: The group of technical and theoretical subjects comprise medicine - specialities and hygiene - nursing.

s - mean
m - minimum
M - maximum

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TABLE VI_2 (cont'd)

Academic Year

SECONDARY SCHOOLS FOR MEDICAL PERSONNEL

	1972/73				1973/74				1974/75			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	13976	11160	8844	7947	15716	12129	10263	8297	16915	13637	11152	9624
Number of classes	456.7	364.7	289.0	259.7	518.7	400.3	338.7	273.8	563.8	454.6	371.7	320.8

Estimate of the required of teachers

	1972/73			1973/74			1974/75		
	m	s	M	m	s	M	m	s	M
1. Mother tongue	159	173	187	178	194	209	199	216	233
2. Foreign language	125	137	149	139	153	167	155	172	186
3. Latin	41	41	41	47	47	47	51	51	51
4. Geography	0	19	37	0	20	41	0	23	46
5. History	14	44	75	16	50	83	17	55	33
6. Social sciences	0	17	33	0	18	37	0	21	42
7. Economics and business management	0	27	54	0	31	62	0	34	68
8. Biology	58	133	208	66	149	232	72	165	259
9. Mathematics	65	88	112	74	100	125	81	110	139
10. Physics	41	61	81	47	69	91	51	76	100
11. Chemistry	41	143	244	47	160	273	51	177	304
12. Physical and health education	125	156	187	139	174	209	155	194	233
13. Practical training	0	191	382	0	212	424	0	239	478
14. Technical and theoretical subjects (50 %)	288 (144)	1038 (519)	1789 (894)	323 (162)	1159 (580)	1996 (998)	359 (179)	1299 (649)	2238 (1119)
TOTAL	957 (813)	2268 (1749)	3579 (2684)	1076 (915)	2536 (1957)	3996 (2998)	1191 (1011)	2832 (2182)	4470 (3351)

NOTA BENE: The group of technical and theoretical subjects comprises medicine - specialities and hygiene - nursing

s - mean
m - minimum
M - maximum

TABLE VI_3

ESTIMATE OF THE REQUIRED NUMBER OF NEW TEACHERS FOR THE PERIODS 1964/65–1969/70 (D_{69}) AND 1969/70 – 1974/75 (D_{74})

SECONDARY SCHOOLS FOR
MEDICAL PERSONNEL

	MINIMUM				MAXIMUM				AVERAGE				
SUBJECTS	D_{69}	Total	D_{74}	Total	D_{69}	Total	D_{74}	Total	D_{74}	Total	D_{74}	Total	X
1. Mother tongue	67	72	100	105	89	94	117	122	78	83	108	113	1
2. Foreign language	44	49	78	83	65	70	94	99	54	59	86	91	1
3. Latin	22	22	26	22	22	22	26	26	22	22	26	26	0
4. Geography	-5	-5	0	0	25	25	23	23	10	10	12	12	0
5. History	-13	-8	9	14	36	41	48	53	12	17	28	33	1
6. Social sciences	-	-	0	-	-	-	21	-	-	-	11	-	-
7. Economics and business man.	0	0	0	0	46	46	33	33	23	23	16	17	0
8. Biology	28	33	36	41	151	156	130	135	89	24	83	88	1
9. Mathematics	36	41	41	46	74	79	70	75	55	60	56	60	1
10. Physics	16	21	26	31	46	51	51	56	31	36	38	44	1
11. Chemistry	-10	0	27	37	156	166	153	163	73	83	90	100	2
12. Physical and health educ.	73	88	78	93	124	139	117	132	99	114	98	112	3
13. Practical training	-183	-183	0	0	131	131	238	238	-26	-26	119	119	0
14. Technical and theoretical subjects	-175	-55	90	210	439	559	561	681	132	252	325	446	24
TOTAL	-100	75	511	686	1404	1579	1682	1836	652	827	1096	1261	

D_{69} stands for the number of teachers who should enter the teaching profession (or stop teaching) by 1969/70. The reasons are: increase in the number of pupils, compensation for the inherited shortage of teaching staffs as well as compensation for the losses caused by death or retirement.

D_{74} is analogous to D_{69} for the period 1969/70 – 1974/75

Total = $D_{69} + 5x$ is the number of teachers who should enter the teaching profession (or stop teaching). It results from the increase in the number pupils, inherited shortage of teachers, losses caused by death or retirement and from the substitution or untrained teachers by the trained ones.

$X = 0{,}084\ Ni_{,69}$ ($Ni_{,69}$ is the number of untrained teachers in 1964)

NOTA BENE: Data on teachers of social science subjects are unreliable.

TABLE VII_1

ESTIMATE OF THE NUMBER OF TEACHERS FOR PARTICULAR SUBJECTS IN 1964/65

SECONDARY TEACHERS, TRAINING SCHOOLS

subjects	Ai	Si	Fi	Xi	Ui	Yi	Bi,64	Zi/B62/	Ni,64
1. Mother tongue	220	15.4	3388.0	14.33	180	11.65	152	11.82	18
2. Foreign lang.	225	11.1	2489.7	10.53	132	8.54	112	24.44	27
3. History	141	13.7	1931.7	8.17	102	6.60	86	12.77	11
4. Geography	114	12.3	1402.2	5.93	74	4.79	63	13.16	8
5. Biology	124	13.1	1624.4	6.87	86	5.57	73	29.03	21
6. Mathematics	160	12.8	2048.0	8.66	109	7.06	92	50.00	46
7. Physics	115	10.6	1219.0	5.16	65	4.21	55	52.17	29
8. Chemistry	90	10.8	972.0	4.11	52	3.37	44	44.44	20
9. Social sciences	29	5.5	159.3	0.67	8	0.52	7	0.00	0
10. Physical and health educ.	92	16.7	1536.4	-	92	5.95	78	68.48	53
11. Technical education	85	17.5	1487.5	6.29	79	5.11	67	54.12	36
12. Drawing and painting	90	13.8	1242.o	-	90	5.83	76	54.44	41
13. Music educ.	109	14.8	1613.2	-	109	7.06	92	73.39	68
14. Philosophy, logic, psychology	167	6.8	1135.6	4.80	60	3.88	51	5.99	3
15. Pedagogic sc.	255	9.3	2371.5	10.03	126	8.16	107	12.55	13
16. Other subj.	330	10.3	3406.7	14.41	181	11.72	154		
			28027.2 F 23635.6	99.96	1545	I00.02	1309		394

$F = \sum Fi - F_{10} - F_{12} - F_{13}$

$Up = U - U_{10} - U_{12} - U_{13} = 1254$

$U = 1545$

$B_{64} = 1309$ (Bulletin no.355; total number of teachers in 1964/65)

$Yi \% B_{64} = Bi,64$ (Bi,64 is the number of teachers of subject "i" in 1964/65

$Zi \% Ai = Ni,62$ (Ni,62 is the number of untrained teachers of subject "i"

$Zi \% Bi,64 = Ni,64$

TABLE VII$_2$

SECONDARY TEACHER TRAINING SCHOOLS

Academic Year

	1965/66					1966/67				
Form	I	II	III	IV	V	I	II	III	IV	V
Number of pupils	6506	6256	6346	5679	2809	6088	5402	5389	5557	3058
Number of classes	216.8	308.5	211.5	189.3	90.3	202.9	180.6	179.6	185.2	101.9
	Estimate of the required number of teachers									
1. Mother language	153					145				
2. Foreign language	112					104				
3. History	103					93				
4. Geography	75					68				
5. Biology	77					69				
6. Mathematics	132					120				
7. Physics	77					69				
8. Chemistry	57					49				
9. Social sciences	16					19				
10. Physical and health education	129					120				
11. Technical education	83					77				
12. Drawing and painting	79					73				
13. Music education	93					86				
14. Philosophy, logic, psychology	70					69				
15. Pedagogic sciences	132					129				
Total	1393					1290				

TABLE VII$_2$ (Cont'd)

SECONDARY TEACHER TRAINING SCHOOLS	Academic Year									
	1967/68					1968/69				
Form	I	II	III	IV	V	I	II	III	IV	V
Number of pupils	5874	5055	4658	4719	2993	5381	4877	4354	4079	2541
Number of classes	195.8	168.5	155.3	157.3	99.8	179.3	162.6	145.1	136.0	84.7
	Estimate of the required number of teachers									
1. Mother tongue	132					121				
2. Foreign language	96					88				
3. History	83					77				
4. Geography	62					57				
5. Biology	64					60				
6. Mathematics	111					102				
7. Physics	64					60				
8. Chemistry	44					42				
9. Social sciences	18					15				
10. Physical and health education	110					100				
11. Technical education	71					64				
12. Drawing and painting	66					60				
13. Music education	80					72				
14. Philosophy, logic, psychology	61					53				
15. Pedagogic sciences	115					100				
Total	1177					1071				

TABLE VII$_2$ (Cont'd)

SECONDARY TEACHER TRAINING SCHOOLS	Academic Year 1969/70					Academic Year 1970/71				
Form	I	II	III	IV	V	I	II	III	IV	V
Number of pupils	4998	4675	4712	4207	2958	5023	4304	4265	4433	2286
Number of classes	166.6	155.8	157.1	140.2	98.6	167.4	143.5	142.2	147.8	76.2
	Estimate of the required number of teachers									
1. Mother language	122					116				
2. Foreign language	88					83				
3. History	77					74				
4. Geography	56					55				
5. Biology	58					55				
6. Mathematics	102					96				
7. Physics	58					55				
8. Chemistry	43					39				
9. Social sciences	18					14				
10. Physical and health education	103					96				
11. Technical education	65					62				
12. Drawing and painting	61					58				
13. Music education	73					69				
14. Philosophy, logic, psychology	58					54				
15. Pedagogic sciences	109					101				
Total	1091					1027				

TABLE VII$_2$ (Cont'd)

SECONDARY TEACHER
TRAINING SCHOOLS

	Academic Year									
	1971/72					1972/73				
Form	I	II	III	IV	V	I	II	III	IV	V
Number of pupils	5580	4325	3927	4012	2409	5811	4805	3946	3694	2180
Number of classes	186.0	144.2	130.9	133.7	80.3	193.7	160.2	131.5	123.1	72.7
	Estimate of the required number of teachers									
1. Mother language	115					117				
2. Foreign language	85					87				
3. History	73					74				
4. Geography	54					55				
5. Biology	57					60				
6. Mathematics	97					100				
7. Physics	57					60				
8. Chemistry	38					40				
9. Social sciences	15					13				
10. Physical and health education	96					96				
11. Technical education	61					62				
12. Drawing and painting	58					59				
13. Music education	70					71				
14. Philosophy, logic, psychology	51					48				
15. Pedagogic sciences	96					90				
Total	1023					1032				

TABLE VII_2 (Cont'd)

SECONDARY TEACHER
TRAINING SCHOOLS

Academic Year

	1973/74					1974/75				
Form	I	II	III	IV	V	I	II	III	IV	V
Number of pupils	6267	5004	4384	3712	2007	6312	5396	4565	4124	2017
Number of classes	208.9	166.8	146.1	123.7	66.9	210.4	179.8	152.2	137.5	67.2
	Estimate of the required number of teachers									
1. Mother language	123					130				
2. Foreign language	91					95				
3. History	79					83				
4. Geography	59					62				
5. Biology	65					67				
6. Mathematics	106					110				
7. Physics	65					67				
8. Chemistry	43					45				
9. Social sciences	12					12				
10. Physical and health education	100					105				
11. Technical education	65					68				
12. Drawing and painting	62					65				
13. Music education	74					78				
14. Philosophy, logic, psychology	48					51				
15. Pedagogic sciences	90					96				
Total	1082					1134				

TABLE VII_3

ESTIMATE OF THE REQUIRED NUMBER OF NEW TEACHERS FOR THE PERIODS 1964/65 - 1969/70 (D_{69}) and 1969/70 - 1974/75 (D_{74})

SECONDARY TEACHER
TRAINING SCHOOLS

subjects	D_{69}	Total	D_{74}	Total	X
1. Mother tongue	- 9	1	27	37	2
2. Foreign language	- 1	9	21	31	2
3. History	3	8	18	23	1
4. Geography	2	7	15	20	1
5. Biology	- 5	5	18	28	2
6. Mathematics	24	44	24	44	4
7. Physics	11	21	18	28	2
8. Chemistry	6	16	9	19	2
9. Social sciences	13	13	- 4	- 4	0
10. Physical and health education	38	58	18	38	4
11. Technical education	8	23	13	28	3
12. Drawing and painting	- 5	10	23	38	3
13. Music education	- 6	24	16	46	6
14. Philosophy, logic, psychology	15	15	1	1	0
15. Pedagogic sciences	18	23	3	8	1
TOTAL	112	277	220	385	

D_{69} stands for the number of teachers who should enter the teaching profession (or stop teaching) by 1969/70. The reasons why new teachers are required are: increase in the number of pupils and compensation for the shortage of teachers caused by death and retirement.

Total - D_{69} + 5x is the number of teachers who should enter the teaching profession (or stop teaching) in the period 1964/65-1969/70. It results from the increase in the number of pupils, losses caused by death and retirement and from the substitution of untrained teachers by the trained ones.

X - 0.084 Ni,64

Ni,64 is the number of untrained teachers of subject "i" in 1964/65

TABLE VIII

ESTIMATE OF THE NUMBER OF TEACHERS IN 1964/65

ART SCHOOLS
SCHOOLS OF MUSIC

B_{64}	U_{69}	P_{69}	D_{69}	U_{74}	P_{74}	D_{74}
517	3634	727	301	4943	989	367

B_{64} = 67% 771 (bulletin 355 - number of teachers in 1964/65)

U_{69} = 57% 6375(U_{69} = number of pupils who will, according to the estimate attend schools of music in 1969/70)

$P_{69} = \frac{1}{5}$ U_{69} (P_{69} stands for teacher requirements in 1969/70)

D_{69} = stands for the number of teachers who should enter the teaching profession by 1969/70.

TABLE VIII (cont'd)

ESTIMATE OF THE NUMBER OF TEACHERS IN 1964/65

SECONDARY ART SCHOOLS
BALLET AND DRAMA SCHOOLS

D_{64}	U_{69}	T_{69}	D_{69}	U_{74}	P_{74}	D_{74}
69	945	126	72	1 197	160	55

B_{64} = 9% 771 (bulletin no.355 - number of teachers in 1964/65)

U_{69} = number of pupils who will, according to the estimate, attend ballet schools in 1969/70.

$P_{69} = \frac{1}{7\ 5}\ U_{69}$ - teacher requirements in 1969/70

D_{69} = stands for the number of teachers who should enter the teaching profession by 1969/70.

TABLE $VIII_1$

ESTIMATE OF THE NUMBER OF TEACHERS FOR PARTICULAR SUBJECTS IN 1964/65

SECONDARY ART SCHOOLS
APPLIED ART SCHOOLS

subjects	Ai	Si	Fi	Xi	Ui	Yi	Bi,64	ZI/B62	NI,64
1. Mother tongue	42	12.3	516.6	15.22	27	10.84	20	11.90	2
2. Foreign language	41	8.9	364.9	10.75	19	7.63	14	21.95	3
3. Social sciences (History, geography, sociology)	48	6.3	302.4	8.91	16	6.43	12	29.17	2
4. Economics and business manag.	0	0.0	0.0	0.00	0	0.00	0		
5. Physical and health education	4	14.0	56.0		4	1.61	3	75.00	2
6. Mathematics	13	7.5	97.5	2.87	5	2.01	4	76.92	3
7. Physics	2	10.0	20.0	0.59	1	0.40	1	50.00	1
8. Chemistry	2	3.0	6.0	0.18	0	0.00	0	100.00	0
9. Textile technology	17	7.7	130.9	3.86	7	2.81	5	82.35	4
10. Mechanical engineering	4	7.8	31.2	8.92	2	0.80	1	25.00	0
11. Applied art	166	10.9	1809.4	53.32	93	37.35	70	34.94	24
12. Practical training	69	9.9	683.1		69	27.71	51	47.83	24
13. Other subjects	25	4.6	115.0	3.39	6	2.41	4		
	433		4133.0 F = 3393.9	100.00	249	100.00	185		65

$F = \sum Fi - F5 - F_{12}$

$U = 24\% \ 1037 - 249$

$Up - U - U_5 - U_{12} = 176$

$B_{64} = 24 \% \ 771 = 185$ (Total number of teachers in 1964/65).

$Yi \% B_{64} = Bi,64$ (Bi,64 is the number of teachers of subject "i")

$Zi \% Ai = Ni,62$ (NI,62 is the number of untrained teachers of subject "i")

$Zi \% Bi,64 = Ni,64$

The sum of teachers of history and geography was bigger than the number of social science teachers.

NOTA BENE: According to bulletin no.346 total number of art school teachers is 841 but this number does not agree with bulletin no. 356, data which served as the basis for the above estimate

TABLE $VIII_2$

Academic Year

SECONDARY ART SCHOOLS
APPLIED ART SCHOOLS

	1965/66				1966/67				1967/68			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	558	413	349	266	562	401	342	302	587	404	332	296
Number of Classes	34.9	25.8	21.8	16.6	35.1	25.1	21.4	18.9	36.7	25.3	20.8	18.5

Estimate of the required number of teachers

	m	s	M	m	s	M	m	s	M
1. Mother tongue	14	14	14	14	14	14	14	14	14
2. Foreign language	9	9	9	9	9	9	9	9	9
3. History	6	6	6	5	5	5	6	6	6
4. Social sciences	6	6	6	6	6	6	6	6	6
5. Economics and business mana.	8	8	8	8	8	8	8	8	8
6. Physical and health educ.	7	7	7	7	7	7	7	7	7
7. Mathematics	14	14	14	14	14	14	14	14	14
8. Physics	9	12	15	9	12	15	9	12	15
9. Chemistry	3	11	19	3	11	19	3	11	19
10. Textile technology	0	7	14	0	7	14	0	7	14
11. Mechanical eng.	3	5	6	3	4	5	3	5	6
12. Applied art	67	102	137	68	104	140	68	105	141
13. Practical training	10	13	15	10	13	15	10	13	15
TOTAL	156	213	270	156	214	271	157	217	274

s – mean
m – minimum
M – Maximum

TABLE VIII$_2$ (Cont'd)

SECONDARY ART SCHOOLS
APPLIED ART SCHOOLS

ACADEMIC YEAR	1968/69				1969/70				1970/71			
F o r m	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	587	423	335	287	600	510	378	308	600	521	456	349
Number of classes	36.7	20.4	20.9	17.9	37.5	31.9	23.6	19.3	37.5	32.6	28.5	21.8

	Estimate of the required number of teachers								
	1968/69			1969/70			1970/71		
	m	s	M	m	s	M	m	s	M
1. Mother tongue	14	14	14	15	15	15	16	16	16
2. Foreign language	9	9	9	10	10	10	11	11	11
3. History	6	6	6	6	6	6	6	6	6
4. Social sciences	6	6	6	7	7	7	7	7	7
5. Economics and bus.management	8	8	8	9	9	9	9	9	9
6. Physical and health educ.	7	7	7	8	8	8	8	8	8
7. Mathematics	14	14	14	15	15	15	16	16	16
8. Physics	9	12	15	10	14	17	11	14	17
9. Chemistry	3	11	19	3	12	21	3	13	23
10. Textile technology	0	7	14	0	8	16	0	9	17
11. Mechanical engineering	3	5	6	3	5	6	3	5	6
12. Applied art	68	105	141	75	116	156	81	124	167
13. Practical training	10	13	15	11	14	17	12	15	18
T O T A L	157	217	274	172	239	303	183	253	321

s - mean
m - minimum
M - maximum

TABLE VIII$_2$ (Cont'd)

SECONDARY ART SCHOOLS
APPLIED ART SCHOOLS

	Academic Year											
	1971/72				1972/73				1973/74			
Form	I	II	III	IV	I	II	III	IV	I	II	III	IV
Number of pupils	670	521	466	421	697	581	466	430	752	605	520	430
Number of classes	41.9	32.6	29.1	26.3	43.6	36.3	29.1	26.9	47.0	37.8	32.5	26.9

Estimate of the required number of teachers

	1971/72			1972/73			1973/74		
	m	s	M	m	s	M	m	s	M
1. Mother tongue	18	18	18	19	19	19	20	20	20
2. Foreign language	12	12	12	12	12	12	13	13	13
3. History	7	7	7	7	7	7	8	8	8
4. Social sciences	7	7	7	8	8	8	9	9	9
5. Economics and bus. management	10	10	10	11	11	11	11	11	11
6. Physical and health educ.	9	9	9	9	9	9	10	10	10
7. Mathematics	18	18	18	19	19	19	20	20	20
8. Physics	12	16	19	12	16	20	13	17	21
9. Chemistry	4	14	24	4	15	25	4	16	27
10. Textile technology	0	9	18	0	10	19	0	10	20
11. Mechanical eng.	4	6	7	4	6	7	4	6	8
12. Applied art	88	135	181	92	141	189	97	149	200
13. Practical training	13	17	20	14	18	21	15	19	22
TOTAL	202	278	350	211	291	366	224	308	389

s - mean
m - minimum
M - maximum

TABLE VIII$_2$ (Cont'd)

Academic Year

SECONDARY ART SCHOOLS
APPLIED ART SCHOOLS

1974/75

Form	I	II	III	IV
Number of pupils	758	653	542	479
Number of classes	47·4	40·8	33·9	29·9

Estimate of the required number of teachers

	m	s	M
1. Mother tongue	21	21	21
2. Foreign language	14	14	14
3. History	8	8	8
4. Social sciences	9	9	9
5. Economics and business management	12	12	12
6. Physical and health education	10	10	10
7. Mathematics	21	21	21
8. Physics	14	18	22
9. Chemistry	4	16	28
10. Textile technology	0	11	22
11. Mechanical technology	4	6	8
12. Applied art	103	157	211
13. Practical training	16	20	23
Total	236	323	409

s - mean
m - minimum
M - maximum

TABLE VIII$_3$

ESTIMATE OF THE REQUIRED NUMBER OF NEW TEACHERS FOR THE PERIODS 1964/65 - 1969/70 /D_{69}/ AND 1969/70 - 1974/75 /D_{74} /

SECONDARY ART SCHOOLS
APPLIED ART SCHOOLS

subjects	D_{69}	Total	D_{74}	Total	D_{69}	Total	D_{74}	Total	D_{69}	Total	D_{74}	Total	X
1. Mother tongue	- 8	- 8	9	9	- 8	- 8	9	9	- 8	- 8	9	9	0
2. Foreign language	- 6	- 6	6	6	- 6	- 6	6	6	- 6	- 6	6	6	0
3. Social sciences	3	3	6	6	3	3	6	6	3	3	6	6	0
4. Economics and business management	10	10	5	5	10	10	5	5	10	10	5	5	0
5. Physical and health educ.	6	6	3	3	6	6	3	3	6	6	3	3	0
6. Mathematics	12	12	9	9	12	12	9	9	12	12	9	9	0
7. Physics	10	10	6	6	17	17	8	8	14	14	7	7	0
8. Chemistry	3	3	2	2	22	22	11	11	12	12	6	6	0
9. Textile technology	- 5	- 5	0	0	12	12	9	9	4	4	5	5	0
10. Mechanical engineering	2	2	2	2	5	5	3	3	3	3	3	3	0
11. Applied art	16	26	41	51	102	112	82	92	59	69	61	71	2
12. Practical training	-35	-25	7	17	-28	-18	9	19	-32	-22	8	18	2
TOTAL	8	28	96	116	147	167	160	180	77	97	128	148	

D_{69} stands for the number of teachers who should enter the teaching profession (or stop teaching) in the period 1964/65 - 1969/70 - It results from the increase in the number of pupils and in order to compensate for the losses through death and retirement.

Total = D_{69} + 5x is the number of teachers who should enter the teaching profession (or stop teaching) in the period 1964/65 - 1969/70. It results from the increase in the number of pupils, losses caused by retirement and death and from the substitution of untrained teachers by the trained ones.

X = 0.084 Ni,64
Ni,64 is the number of untrained teachers of subject "i" in 1964/65.

TABLE IX_1

ESTIMATE OF THE NUMBER OF TEACHERS FOR PARTICULAR SUBJECTS IN 1964/65

SCHOOLS FOR SKILLED WORKERS
(All branches dealt with together)

SUBJECTS	Ai	Fi	Xi	Ui	Yi	Bi_{64}	Ci	Bi_{64}	Zi	$N\tilde{i}_{64}$
1. Mother tongue	554	6875.7	20.94	516	16.08	554	344	898	69%	620
2. History	97	664.1	2.02	50	1.56	54	33	87	81%	70
3. Social sciences	244	1977.0	6.02	148	4.61	159	99	958	63%	163
4. Economics and business management	23	280.0	0.85	21	0.65	22	14	36	74%	27
5. Physical and health educ.	135	1932.0	-	135	4.21	145	90	235	89%	209
6. Mathematics	540	6325.2	19.26	474	14.78	509	316	825	88%	726
7. Physics	222	1649.2	5.02	124	3.87	133	83	216	91%	197
8. Chemistry	80	404.0	1.23	30	0.94	32	20	52	86%	45
9. Practical training	611	16757.0	-	611	19.05	656	408	1064	68%	724
10. Vocational theoretical sub.	371	12783.0	38.92	958	29.86	1028	640	1668	69%	1151
11. Other subjects	210	1882.6	5.73	141	4.40	152	94	246		
TOTAL	4087	51529.8	99.99	3208	100.01	3444	2141	5585		3932

$F = Fi - F_5 - F_9$; Fi is the total number of hours a week
Fi is the weekly number of periods given to subject "i"

U = 3208 (number of teachers in 1964/65)

Up= U - U5 - U9 = 2462

B64 = 3444 (number of teachers in 1964/65)

Ci (teachers for particular subjects in schools within school centres)

Bi,64 = Ci + Bi,64 (number of teachers of subject "i")

C = 2141 (estimated number of teachers in school centres; bulletin no.346)

Ci = Yi % C

Zi % Ai = Ni,62 (Ni,62 is the number of untrained teachers of subject "i")

Zi % Bi,64 = Ni,64

TABLE IX$_2$

SCHOOLS FOR SKILLED WORKERS
(All branches dealt with together)

ACADEMIC YEAR

	1965 - 66			1966 - 67			1967 - 68			1968 - 69			1969 - 70		
F o r m	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Number of pupils	85507	67302	37164	86395	69900	39683	90561	70626	41214	90749	74032	41642	92967	80267	50408
Number of classes	2850.2	2243.4	1236.7	2879.5	2329.8	1322.6	3018.4	2354.0	1373.7	3024.7	2467.5	1387.9	3098.6	2675.3	1680.1
	Estimate of the required number of teachers														
	s	m	M	s	m	M	s	m	M	s	m	M	s	m	M
1. Mother tongue	717	826	935	762	862	961	763	879	995	779	897	1015	839	969	1100
2. History	127	295	463	132	306	481	136	314	492	140	325	510	158	362	565
3. Social sciences	94	189	284	97	197	296	100	203	306	102	207	312	110	231	352
4. Economics and business manag.	193	363	533	199	373	548	208	385	563	209	394	578	232	431	631
5. Physical and health education	571	603	635	588	620	652	609	643	676	621	655	689	670	706	742
6. Mathematics	562	875	1187	578	951	1223	598	931	1264	610	950	1291	659	1029	1399
7. Physics	26	269	513	26	274	523	27	284	541	27	289	551	28	304	579
8. Chemistry	0	337	673	0	348	695	0	359	718	0	366	731	0	397	795
9. Practical training	1077	1772	2466	1101	1820	2539	1115	1871	2627	1161	1919	2677	1233	2065	2897
10. Technical and theoretical subjects (90% on the average)	1923 (1651)	3453 (3100)	4984 (4549)	1977 (1697)	3556 (3193)	5135 (4689)	2047 (1755)	3678 (3300)	5309 (4845)	2087 (1792)	3750 (3367)	5414 (4942)	2253 (1933)	4071 (3650)	5888 (5377)
T o t a l	5290 (5018)	8982 (8629)	12673 (12230)	5460 (5180)	9307 (8944)	13053 (12607)	5603 (5311)	9547 (9184)	13491 (13027)	5736 (5441)	9752 (9369)	13768 (13296)	6182 (5862)	10565 (10144)	14948 (14437)

s - mean
m - minimun
M - maximum

TABLE IX$_2$ (cont'd)

SCHOOLS FOR SKILLED WORKERS
(All branches dealt with together)

ACADEMIC YEAR

	1970 - 71			1971 - 72			1972 - 73			1973 - 74			1974 - 75		
Form	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Number of pupils	93920	82889	48597	104346	83072	49785	108671	92294	50295	117184	96120	55878	114874	103648	58195
Number of classes	3130.7	2741.0	1619.9	3478.2	2269.1	1659.5	3622.4	3076.5	1676.5	3906.1	3204.0	1862.6	3829.1	3454.9	1939.8
	Estimate of the required number of teachers														
	s	m	M	s	m	M	s	m	M	s	m	M	s	m	M
1. Mother tongue	844	974	1105	893	1029	1166	949	1093	1237	1014	1169	1323	1042	1202	1363
2. History	159	366	572	161	371	580	173	401	629	184	425	666	196	454	711
3. Social sciences	111	230	349	117	240	363	124	252	379	133	271	410	136	281	426
4. Economics and business manag.	229	428	627	244	457	671	252	473	694	275	516	756	278	521	764
5. Physical and health education	673	709	745	713	753	792	757	797	837	810	853	897	830	874	918
6. Mathematics	662	1034	1407	700	1091	1482	744	1158	1572	795	1239	1682	815	1276	1736
7. Physics	28	308	588	32	230	628	33	352	671	35	374	713	35	382	728
8. Chemistry	0	399	797	0	421	842	0	444	888	0	477	954	0	489	978
9. Practical training	1242	2076	2911	1333	2205	3077	1406	2331	3256	1509	2500	3491	1527	2555	3584
10. Technical and theoretical subjects (90% on the average)	2270 (1946)	4090 (3671)	5911 (5397)	2394 (2053)	4310 (3868)	6226 (5684)	2544 (2184)	4568 (4101)	6592 (6018)	2718 (2333)	4887 (4388)	7057 (6442)	2796 (2401)	5035 (4521)	7273 (6641)
Total	6218 (5894)	10614 (10195)	15012 (14498)	6587 (6246)	11107 (10665)	15827 (15285)	6982 (6622)	11869 (11402)	16755 (16181)	7473 (7088)	12711 (12212)	17949 (17334)	7655 (7260)	13069 (12555)	18481 (17849)

m - minimum
M - maximum
s - mean

TABLE IX_3

ESTIMATE OF THE REQUIRED NUMBER OF NEW TEACHERS FOR THE PERIODS 1964/65 - 1969/70 (D_{69}) AND 1969/70 - 1974/75 (D_{74})

SCHOOLS FOR SKILLED WORKERS (All branches dealt with together)	MINIMUM				MAXIMUM				AVERAGE				
SUBJECTS	D_{69}	Total	D_{74}	Total	D_{69}	Total	D_{74}	Total	D_{69}	Total	D_{74}	Total	X
1. Mother tongue	72	332	341	601	349	609	444	704	211	470	393	653	52
2. History	88	118	64	94	521	551	240	270	304	335	152	182	6
3. Social sciences	-119	-49	44	114	138	208	231	301	10	79	137	207	14
4. Economics and business manag.	214	224	84	94	637	647	236	246	425	436	160	170	2
5. Physical and health educ.	497	587	270	360	574	664	298	388	536	625	284	374	18
6. Mathematics	-53	252	264	569	733	1038	567	872	340	645	416	721	61
7. Physics	-167	-82	12	57	418	503	245	330	125	211	126	213	17
8. Chemistry	-47	-27	0	20	797	817	313	333	375	395	157	176	4
9. Practical training	339	639	497	797	2006	2306	1163	1463	1173	1472	830	1130	60
10. Technical and theoretical subjects	871	1356	914	1399	4731	5216	2353	2838	2801	3286	1633	2118	97
TOTAL	1695	3350	2490	4145	10904	12559	6090	7745	6300	7954	4290	5944	

D_{69} Stands for the number of teachers who should enter the teaching profession (or stop teaching) by 1969/70

D_{74} is analogous to D_{69} for the period 1969/70 - 1974/75

Total = D_{69} + 5x (number of teachers who should enter the teaching profession (or stop teaching). It results from the increase in the number of pupils, losses caused by retirement and death and from substitution of untrained teachers by the trained ones.)

x = 0.084 Ni,64 (Ni,64 is the number of untrained teachers in 1964)

SCHOOLS FOR SKILLED WORKERS
METAL-MANUFACTURING BRANCH

TABLE IX A_2

ACADEMIC YEAR

	1965 - 66			1966 - 67			1967 - 68			1968 - 69			1969 - 70		
F o r m	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Number of pupils	34203	26921	14866	34558	27960	15873	36224	23250	16486	36300	27613	16657	37187	32107	20163
Number of classes	1140.1	897.4	495.5	1151.9	932.0	529.1	1207.5	941.7	549.5	1210.0	987.1	555.2	1232.6	1070.2	672.1
	Estimate of the required number of teachers														
	m	s	M	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	230	320	409	238	331	423	245	341	436	250	348	445	271	379	486
2. History	0	145	290	0	151	302	0	154	307	0	160	320	0	177	353
3. Social sciences	0	45	90	0	48	96	0	50	100	0	51	101	0	61	122
4. Economics and business manag.	23	135	246	24	139	253	25	145	265	25	146	266	31	161	291
5. Physical and health education	230	256	282	238	264	290	245	273	300	250	278	305	271	299	327
6. Mathematics	230	466	702	238	483	727	245	497	749	250	508	766	271	554	836
7. Physics	0	160	319	0	163	326	0	168	336	0	172	344	0	182	364
8. Chemistry	0	285	569	0	295	590	0	304	608	0	311	621	0	341	682
9. Technical and theoretical subjects (95%)	445 (423)	1451 (1378)	2456 (2333)	459 (436)	1501 (1426)	2543 (2416)	471 (447)	1547 (1470)	2622 (2491)	485 (461)	1582 (1503)	2678 (2544)	522 (496)	1725 (1639)	2927 (2781)
10. Practical training	553	1198	1842	564	1232	1900	586	1274	1962	593	1297	2001	621	1395	2168
T o t a l	1711 (1689)	4461 (4388)	7205 (7082)	1761 (1738)	4607 (4532)	7450 (7323)	1817 (1793)	4753 (4676)	7685 (7554)	1853 (1829)	4853 (4774)	7847 (7713)	1987 (1961)	5274 (5188)	8556 (8410)

NOTA BENE: The group of technical and theoretical subjects comprises: electrical-engineering - power current, mechanical-engineering and metallurgy.

SCHOOLS FOR SKILLED WORKERS
METAL-MANUFACTURING BRANCH

TABLE IX A_2 (cont'd)

ACADEMIC YEAR

	1970 - 71			1971 - 72			1972 - 73			1973 - 74			1974 - 75		
Form	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Number of pupils	37567	32891	19440	41738	33229	19914	43468	36918	20118	46874	38448	22351	45949	41459	23279
Number of classes	1252.2	1096.4	648.0	1391.3	1107.6	663.8	1448.9	1230.6	670.6	1562.5	1281.6	745.0	1531.6	1382.0	776.0
	Estimate of the required number of teachers														
	m	s	M	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	272	380	488	287	400	512	305	424	543	326	454	582	335	468	601
2. History	0	179	358	0	181	362	0	199	397	0	209	417	0	224	447
3. Social sciences	0	59	118	0	61	121	0	61	122	0	68	135	0	71	141
4. Economics and business manag.	29	159	289	30	170	310	30	175	319	34	192	349	35	193	350
5. Physical and health education	272	301	329	287	319	351	305	338	370	326	362	397	335	370	405
6. Mathematics	272	556	840	287	584	880	305	620	934	326	663	1000	335	685	1035
7. Physics	0	185	370	0	196	391	0	211	421	0	223	446	0	230	460
8. Chemistry	0	342	683	0	358	716	0	378	756	0	406	812	0	420	839
9. Technical and theoretical subjects (95%)	529 (503)	1733 (1646)	2936 (2789)	552 (524)	1816 (1725)	3080 (2926)	594 (564)	1930 (1834)	3265 (3102)	630 (599)	2064 (1961)	3498 (3323)	656 (623)	2136 (2029)	3615 (3434)
10. Practical training	627	1403	2179	680	1490	2300	717	1577	2436	769	1690	2610	771	1727	2683
Total	2001 (1975)	5297 (5810)	8590 (8443)	2123 (2095)	5575 (5484)	9023 (8869)	2256 (2226)	5913 (5817)	9563 (9400)	2411 (2380)	6331 (6228)	10246 (10071)	2467 (2434)	6524 (6417)	10576 (10395)

NOTA BENE : The group of technical and theoretical subjects comprises: electrical-engineering - power current, mechanical - engineering and metallurgy.

s - mean
m - minimum
M - maximum

TABLE IX B_2

Academic Year

SCHOOLS FOR SKILLED WORKERS ELECTRICAL-ENGINEERING BRANCH	1965 - 66			1966 - 67			1967 - 68			1968 - 69			1969 - 70		
Form	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Number of pupils	8551	6730	3716	8640	6990	3968	9056	7063	4121	9075	7403	4164	9297	8027	5041
Number of classes	285.0	224.3	123.9	288.0	233.0	132.3	301.9	235.4	137.4	302.5	246.8	138.8	309.9	267.6	168.0
	Estimate of the required number of teachers														
	m	s	M	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	46	59	71	47	60	72	49	62	75	50	63	76	52	67	82
2. History	0	17	33	0	17	34	0	18	35	0	18	36	0	19	38
3. Social sciences	0	21	42	0	22	44	0	23	45	0	23	46	0	26	52
4. Economics and business manag.	0	29	58	0	30	59	0	31	61	0	32	63	0	34	68
5. Physical and health educ.	46	52	58	47	53	59	49	55	61	50	56	63	52	60	68
6. Mathematics	72	90	107	73	91	109	76	94	113	77	96	115	81	102	122
7. Physics	26	53	80	26	54	82	27	56	84	27	57	86	28	59	91
8. Technical and theoretical subjects (95%)	186 (177)	609 (579)	1031 (979)	191 (181)	628 (597)	1064 (1012)	198 (188)	650 (618)	1101 (1046)	201 (191)	661 (628)	1122 (1066)	217 (206)	718 (682)	1219 (1159)
TOTAL	376 (367)	930 (900)	1480 (1428)	384 (374)	955 (924)	1523 (1471)	399 (389)	989 (957)	1575 (1520)	405 (395)	1006 (973)	1607 (1551)	430 (419)	1085 (1049)	1740 (1680)

NOTA BENE: The group of technical and theoretical subjects comprises: mechanical-engineering, electrical-engineering - power current and electrical-engineering - low tension current.

s - mean
m - minimum
M - Maximum

TABLE IX B_2 (Cont'd)

Academic Year

SCHOOLS FOR SKILLED WORKERS ELECTRICAL-ENGINEERING BRANCH	1970 - 71			1971 - 72			1972 - 73			1973 - 74			1974 - 75		
Form	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Number of pupils	9392	8223	4860	10434	8307	4979	10867	9229	5030	11718	9612	5488	11488	10365	5819
Number of classes	313.1	274.1	162.0	347.8	276.9	166.0	362.2	307.6	167.7	390.6	320.4	182.9	382.9	345.5	194.0
	Estimate of the required number of teachers														
	m	s	M	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	53	68	82	57	72	88	61	77	93	65	82	99	66	84	101
2. History	0	20	39	0	21	41	0	22	44	0	24	47	0	25	49
3. Social sciences	0	26	52	0	27	53	0	29	57	0	30	60	0	33	65
4. Economics and business manag.	0	34	68	0	36	72	0	38	76	0	41	81	0	42	84
5. Physical and health educ.	53	61	68	57	64	72	61	69	76	65	73	81	66	75	84
6. Mathematics	82	103	123	88	110	132	94	116	139	100	124	149	101	127	152
7. Physics		61	93	32	65	98	33	69	105	35	73	111	35	75	115
8. Technical and theoretical subjects (95%)	219 (208)	721 (685)	1223 (1162)	231 (219)	761 (723)	1290 (1226)	245 (233)	805 (765)	1365 (1297)	261 (248)	859 (816)	1457 (1384)	269 (256)	886 (842)	1504 (1429)
Total	435 (424)	1094 (1058)	1748 (1687)	465 (453)	1156 (1118)	1846 (1782)	494 (482)	1225 (1185)	1955 (1887)	526 (513)	1306 (1263)	2085 (2012)	537 (524)	1347 (1303)	2154 (2079)

NOTA BENE : The group of technical and theoretical subjects comprises: mechanical-engineering - electrical-engineering - power current and electrical-engineering - low tension current.

s - mean
m - minimum
M - maximum

TABLE IX C_2

SCHOOLS FOR SKILLED WORKERS
WOOD AND TIMBER MANUFACTURING
BRANCH

Academic Year	1965-66			1966-67			1967-68			1968-69			1969-70		
Form	I	II	III	I	II	III	II	II	III	I	II	III	I	II	III
Number of pupils	3420	2692	1487	3456	2796	1587	3622	2825	1649	3630	2961	1666	3719	3211	2016
Number of classes	114.0	89.7	49.6	115.2	93.2	52.9	120.7	94.2	55.0	121.0	98.7	55.5	124.0	107.0	67.2
	Estimate of the required number of teachers														
	m	s	M	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	32	39	46	33	40	47	34	42	49	35	43	50	38	46	54
2. History	0	7	13	0	7	13	0	7	14	0	7	14	0	8	16
3. Social sciences	0	29	58	0	30	59	0	31	61	0	32	63	0	34	68
4. Economics and business manag.	2	21	39	2	21	39	3	22	41	3	23	42	3	24	44
5. Physical and health educ.	23	23	23	24	24	24	25	25	25	25	25	25	27	27	27
6. Mathematics	30	43	55	31	44	57	32	46	59	33	47	60	36	51	65
7. Physics	0	5	10	0	5	10	0	6	11	0	6	11	0	6	11
8. Technical and theoretical subject	87	143	198	90	142	194	92	146	200	94	150	205	103	168	221
9. Practical training	0	21	42	0	22	43	0	23	45	0	23	45	0	25	49
T O T A L	174	331	484	180	335	486	186	348	505	190	356	515	207	383	555

NOTA BENE : The group of technical and theoretical subjects comprises: mechanical - engineering, forestry and wood technology.

s - mean
m - minimum
M - maximum

TABLE IX C_2 (Cont'd)

Academic Year

SCHOOLS FOR SKILLED WORKERS WOOD AND TIMBER MANUFACTURING BRANCH	1970 - 71			1971 - 72			1972 - 73			1973 - 74			1974 - 75		
Form	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Number of pupils	3757	3289	1944	4174	3323	1991	4347	3692	2011	4687	3845	2235	4750	4146	2172
Number of classes	125.2	109.6	64.8	139.1	110.8	66.4	144.9	123.1	67.0	156.2	128.2	74.5	158.3	138.2	72.4
	Estimate of the required number of teachers														
	m	s	M	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	38	46	54	40	49	57	43	52	61	46	56	65	47	57	67
2. History	0	8	16	0	8	16	0	9	17	0	9	18	0	10	19
3. Social sciences	0	34	68	0	36	72	0	38	76	0	41	82	0	42	84
4. Economics and business manag.	3	24	44	3	26	48	3	27	50	3	29	54	3	29	55
5. Physical and health educ.	27	27	27	29	29	29	30	30	30	33	33	33	33	33	33
6. Mathematics	36	51	65	38	54	69	40	57	73	43	61	78	44	63	81
7. Physics	0	6	11	0	7	13	0	7	13	0	7	14	0	7	14
8. Technical and theoretical subjects	104	164	223	108	172	235	116	183	249	124	195	266	127	201	274
9. Practical training	0	25	49	0	26	52	0	28	55	0	30	59	0	31	61
TOTAL	208	385	557	218	407	591	232	431	624	249	461	669	254	473	688

NOTA BENE : The group of technical and theoretical subject comprises mechanical - engineering, forestry and wood technology.

s - mean
m - minimum
M - maximum

TABLE II D_2

Academic Year

SCHOOLS FOR SKILLED WORKERS TEXTILE BRANCH	1965-66			1966-67			1967-68			1968-69			1969-70		
Form	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Number of pupils	5130	4038	2230	5184	4194	2381	5434	4238	2473	5445	4442	2498	5578	4816	3025
Number of classes	171.0	134.6	74.3	172.8	139.8	79.4	181.1	141.3	82.4	101.5	148.1	83.3	185.9	160.5	100.8
	Estimate of the required number of teachers														
	m	s	M	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	86	86	86	89	89	89	92	92	92	94	94	94	102	102	102
2. Social sciences	94	94	94	97	97	97	100	100	100	102	102	102	110	110	110
3. Economics and business mag.	19	19	19	20	20	20	20	20	20	21	21	21	24	24	24
4. Physical and health educ.	42	42	42	43	43	43	45	45	45	46	46	46	49	49	49
5. Technical and theoretical subjects (80%)	355 (284)	402 (322)	449 (359)	366 (293)	415 (332)	463 (370)	378 (302)	428 (342)	478 (382)	386 (309)	437 (350)	488 (390)	418 (334)	473 (378)	528 (422)
6. Practical training	0	29	58	0	30	59	0	31	61	0	32	63	0	34	68
TOTAL	590 (519)	672 (529)	748 (658)	615 (542)	694 (611)	771 (678)	635 (559)	716 (630)	796 (700)	649 (572)	732 (645)	814 (716)	703 (619)	792 (697)	881 (775)

NOTA BENE: The group of technical and theoretical subjects comprises: textile and technology

s - mean
m - minimum
M - maximum

TABLE IX D_2 (Cont'd)

Academic Year

SCHOOLS FOR SKILLED WORKERS TEXTILE BRANCH	1970-71			1971-72			1972-73			1973-74			1974-75		
Form	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Number of pupils	5637	4936	2912	6262	4984	2987	6521	5537	3018	7032	5767	3353	6738	6219	3646
Number of classes	187.9	164.5	97.1	208.7	166.1	99.6	217.4	184.6	100.6	234.4	192.2	111.8	224.6	207.3	121.5
	Estimate of the required number of teachers														
	m	s	M	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	102	102	102	108	108	108	114	114	114	122	122	122	126	126	126
2. Social sciences	111	111	111	117	117	117	124	124	124	133	133	133	136	136	136
3. Economics and business manag	24	24	24	24	24	24	26	26	26	28	28	28	30	30	30
4. Physical and health educ.	49	49	49	53	53	53	56	56	56	60	60	60	61	61	61
5. Technical and theoretical subjects (80%)	420 (336)	476 (381)	531 (425)	443 (354)	502 (402)	561 449)	470 (376)	532 (426)	594 (475)	503 (402)	570 (456)	636 (509)	518 (414)	586 (469)	654 (523)
6. Practical training	0	34	68	0	36	72	0	38	76	0	41	82	0	42	84
Total	706 (622)	796 (701)	885 (779)	745 (656)	840 (740)	935 (823)	790 (696)	890 (784)	990 (871)	846 (745)	954 (840)	1061 (934)	871 (767)	981 (864)	1091 (960)

NOTA BENE : The group of technical and theoretical subjects comprises: textile and technology

s - mean
m - minimum
M - maximum

TABLE IX E_2

Academic Year

SCHOOLS FOR SKILLED WORKERS REMAINING BRANCHES	1965 - 66			1966 - 67			1967-68			1968-69			1969-70		
Form	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Number of pupils	34203	26921	14866	34558	27560	15873	36224	28250	16406	36300	29613	16657	37187	32107	20163
Number of classes	1140.1	897.4	495.5	1151.9	918.7	529,1	1207.5	941.7	549.5	1210.o	987.1	555.2	1239.6	1070.2	672.1
	Estimate of the required number of teachers														
	m	s	M	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	323	323	323	330	330	330	343	343	343	350	350	350	376	376	376
2. History	127	127	127	132	132	132	136	136	136	140	140	140	158	158	158
3. Economics and business manag.	149	260	171	153	165	177	160	173	185	160	173	186	174	189	204
4. Physical and health educ.	230	230	230	236	236	236	245	245	245	250	250	250	271	271	271
5. Mathematics	230	277	323	236	283	330	245	294	343	250	300	350	271	324	376
6. Physics	0	52	104	0	53	105	0	55	110	0	55	110	0	57	113
7. Chemistry	0	52	104	0	53	105	0	55	110	0	55	110	0	57	113
8. Technical and theoretical subjects		850			871			908			921			993	
(80%)		(680)			(697)			(726)			(737)			(794)	
9. Practical training		524			537			559			568			612	
Total	2433 (2263)	2595 (2425)	2756 (2586)	2495 (2321)	2660 (2486)	1823 (2649	2596 (2414)	2768 (2586)	2939 (2757)	- 2639 -(2455)	2812 (2628)	2985 (2801)	2855 (2656)	3037 (2838)	3216 (3017)

s - mean
m - minimum
M - maximum

TABLE IX E_2 (cont'd)

A c a d e m i c   Y e a r

SCHOOLS FOR SKILLED WORKERS REMAINING BRANCHES	1970 - 71			1971 - 72			1972 - 73			1973 - 74			1974 - 75		
F o r m	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Number of pupils	37567	32890	19441	41738	33229	19914	43360	36918	20118	46873	38448	22351	45949	41459	23279
Number of classes	1252.2	1096.3	648.0	1391.3	1107.6	663.8	1448.9	1230.6	670.6	1562.4	1281.6	745.0	1531.6	1382.0	776.0
	Estimate of the required number of teachers														
	m -	s	M	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	379	379	379	401	401	401	426	426	426	455	455	455	468	468	468
2. History	159	159	159	161	161	161	173	173	173	184	184	184	196	196	196
3. Economics and business manag.	173	188	202	187	202	217	193	208	223	210	227	244	210	228	245
4. Physical and health educ.	272	272	272	287	287	287	305	305	305	326	326	326	335	335	335
5. Mathematics	272	326	379	287	344	401	305	366	426	326	391	455	335	402	468
6. Physics	0	57	114	0	63	126	0	66	132	0	71	142	0	670	139
7. Chemistry	0	57	114	0	63	126	0	66	132	0	71	142	0	70	139
8. Technical and theoretical subjects		998			1060			1119			1200			1226	
(80%)		(798)			(848)			(895)			(960)			(981)	
9. Practical training		615			653			689			740			756	
T O T A L	2868 (2668)	3051 (2851)	3232 (3032)	3036 (2824)	3234 (3022)	3432 (3220)	3210 (2986)	3418 (3194)	3625 (3401)	3441 (3201)	3665 (3425)	3888 (3648)	3526 (3281)	3751 (3506)	3972 (3727)

s - mean
m - minimum
M - maximum

TABLE X_2

Estimate of the required number of teachers

SECOND-LEVEL SCHOOLS
(All types dealt with together)

Subjects	1965/66			1966/67			1967/68			1968/69			1969/70		
	m	s	M	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	2856	3039	3221	2968	3146	3321	3047	3243	3438	3100	3301	3499	3291	3508	3724
2. Foreign language	1715	1857	1998	1775	1926	2076	1828	1990	2149	1861	2029	2193	1956	2140	2324
3. Classical languages	396	406	415	401	411	420	407	417	427	408	418	428	409	420	431
4. Geography	526	636	743	532	649	765	535	659	782	533	660	785	531	668	804
5. History	1183	1493	1802	1203	1530	1855	1227	1565	1902	1233	1586	1938	1290	1675	2058
6. Social sciences	374	631	887	380	654	925	389	676	961	385	681	977	399	730	1058
7. Economics and business manag.	319	639	959	332	672	1011	350	703	1057	351	723	1091	390	788	1187
8. Biology	656	717	778	655	723	789	682	754	824	659	734	808	676	757	839
9. Mathematics	2651	3286	3919	2741	3454	4068	2825	3520	4214	2871	3589	4307	3014	3798	4579
10. Physics	871	1210	1549	891	1244	1595	910	1279	1645	914	1290	1665	939	1337	1730
11. Chemistry	529	986	1443	544	1018	1491	549	1041	1533	554	1059	1562	575	1119	1663
12. Physical and health educ.	2136	2189	2241	2204	2258	2313	2273	2332	2389	2312	2371	2429	2451	2518	2585
13. Drawing and painting	393	413	432	390	411	431	393	413	433	382	403	423	389	410	430
14. Music education	116	116	116	109	109	109	104	104	104	96	96	96	97	97	97
15. Technical education	503	567	631	510	572	634	515	580	645	510	574	638	523	588	652
16. Psychology, logic and philosophy	309	318	327	327	336	345	328	338	347	322	332	341	341	351	361
17. Hygiene	0	19	36	0	20	38	0	21	41	0	21	42	0	24	47
18. Office management	152	355	558	157	369	581	162	382	603	170	404	637	183	443	703
19. Pedagogic sciences	132	132	132	129	129	129	115	115	115	100	100	100	109	109	109
20. Applied art	67	102	137	68	104	140	68	105	141	68	105	141	75	116	156
21. Practical training	1356	2413	3466	1397	2504	3610	1430	2619	3776	1489	2686	3881	1588	2904	4219
22. Technical and theoretical subjects	5086 (4443)	8123 (7065)	11261 (9782)	5326 (4650)	8581 (7446)	11832 (10265)	5618 (4910)	9050 (7862)	12481 (10813)	5839 (5097)	9400 (8124)	12957 (11217)	6377 (5569)	10296 (8934)	14214 (12302)
Total	22326 (21683)	29647 (28589)	37051 (35572)	23039 (20363)	30820 (29685)	38478 (26911)	23755 (23047)	31906 (30718)	40007 (38339)	24157 (23415)	32562 (31286)	40938 (39198)	25603 (24795)	34796 (33434)	43970 (42058)

NOTA BENE : The group of technical and theoretical subjects comprises: mechanical engineering and textile technology in Schools of applied art.

s - mean
m - minimum
M - maximum

TABLE X_2 (Cont'd)

Estimate of the required number of teachers

SECOND-LEVEL SCHOOLS
(All types dealt with together)

Subjects	1970/71			1971/72			1972/73			1973/74			1974/75		
	m	s	M	m	s	M	m	s	M	m	s	M	m	s	M
1. Mother tongue	3360	3580	3798	3515	3741	3967	3685	3926	4165	3916	4173	4427	4112	4380	4646
2. Foreign language	2004	2200	2394	2077	2289	2499	2167	2392	2617	2290	2538	2784	2424	2673	2917
3. Classical languages	406	417	428	418	429	439	430	441	451	442	453	463	443	454	464
4. Geography	538	676	812	535	685	833	547	712	874	552	729	903	560	745	928
5. History	1287	1684	2080	1321	1736	2150	1378	1828	2278	1445	1933	2418	1493	2021	2546
6. Social sciences	393	738	1083	407	765	1121	417	790	1159	431	830	1231	431	862	1292
7. Economics & business manag.	391	807	1222	407	841	1277	416	867	1318	448	835	1420	451	965	1478
8. Biology	667	752	837	683	776	867	698	801	903	726	839	952	734	859	983
9. Mathematics	3046	3859	4671	3176	4041	4904	3344	4254	5165	3541	4528	5511	3688	4742	5793
10. Physics	937	1340	1745	970	1302	1834	998	1426	1854	1046	1547	2047	1074	1596	2116
11. Chemistry	571	1126	1678	584	1172	1758	605	1232	1855	636	1313	1988	658	1364	2070
12. Physical and health educ.	2495	2561	2626	2599	2671	2741	2720	2795	2869	2885	2967	3049	3016	3103	3189
13. Drawing and painting	384	405	425	390	410	430	393	414	435	402	423	444	402	424	445
14. Music education	93	93	93	94	94	94	95	95	95	99	99	99	103	103	103
15. Technical education	521	584	647	516	581	646	521	588	654	531	599	666	539	605	671
16. Psychology, logic and philosophy	344	354	364	331	341	351	326	336	346	329	339	349	341	351	361
17. Hygiene	0	25	50	0	25	51	0	28	57	0	31	62	0	34	67
18. Office management	189	464	739	208	500	793	230	548	867	253	601	949	275	659	1044
19. Pedagogic sciences	101	101	101	96	96	96	90	90	90	90	90	90	96	96	96
20. Applied art	81	124	167	88	135	181	92	141	189	97	149	200	103	157	211
21. Practical training	1614	2967	4318	1731	3159	4584	1834	3353	4870	1972	3614	5256	2030	3775	5519
22. Technical and theoretical subjects	6685 (5936)	10773 (9338)	14860 (12832)	7132 (6224)	11473 (9933)	15810 (13633)	7574 (6609)	12200 (10554)	16820 (14490)	8229 (7182)	13242 (11443)	18253 (15701)	8848 (7723)	14233 (12275)	19613 (16830)
Total	26107 (25358)	35630 (34195)	45138 (43110)	27278 (26370)	37262 (35722)	47426 (45249)	28560 (27595)	39257 (37611)	49931 (47601)	30360 (29313)	41972 (40175)	53561 (51009)	31821 (30696)	44202 (42244)	56552 (53769)

NOTA BENE : The group of technical and theoretical subjects comprises: mechanical-engineering and textile technology in Schools of applied art.

s - mean
m - minimum
M - maximum

TABLE X_3

ESTIMATE OF THE REQUIRED NUMBER OF TEACHERS FOR THE PERIODS
1964/65 - 1969/70 (D_{69}) and 1969/70 - 1974/75 (D_{74})

SECOND-LEVEL SCHOOLS
(All types dealt with together)

	Minimum				Maximum				Average				
s u b j e c t s	D_{69}	Total	D_{74}	Total	D_{69}	Total	D_{74}	Total	D_{69}	Total	D_{74}	Total	
1. Mother tongue	805	1130	1365	1690	1268	1593	1537	1860	1037	1362	1451	1775	65
2. Foreign language	417	517	792	892	809	909	895	995	613	713	844	944	20
3. History	265	350	405	490	1081	1166	824	909	673	758	614	699	17
4. Geography	25	50	111	136	314	339	252	277	169	194	182	207	5
5. Social sciences	-245	-150	96	191	427	522	509	604	91	186	302	397	19
6. Economics and business management	380	390	124	134	1226	1236	487	497	803	813	306	316	2
7. Philosophy, logic, psychology	176	181	51	56	197	202	54	59	187	192	52	57	1
8. Pedagogic sciences	18	23	3	8	18	23	3	8	18	23	3	8	1
9. Mathematics	714	1244	1167	1697	2376	2906	1974	2403	1545	2075	1571	2101	106
10. Physics	149	349	285	485	987	1187	669	869	568	768	477	677	28
11. Chemistry	23	158	175	210	1178	1313	682	817	600	735	428	513	27
12. Biology	251	301	162	212	425	475	278	328	338	388	220	270	10
13. Office management	-97	-97	125	125	456	456	467	467	179	179	296	296	-
14. Applied art	16	26	41	51	102	112	82	92	59	69	61	71	2
15. Technical education	255	335	95	275	370	450	118	198	313	392	107	237	16
16. Physical and health education	1669	1939	966	1236	1812	2082	1028	1298	1740	2011	997	1267	54
17. Drawing and painting	109	199	82	172	152	242	90	180	131	220	86	176	18
18. Music education	-74	-14	21	81	-74	-14	21	81	-74	-14	21	81	12
19. Classical languages	167	182	97	112	190	205	100	115	179	194	99	114	3
20. Hygiene	-15	-10	0	5	36	41	28	33	10	15	14	19	1
21. Practical training	107	517	708	1118	2781	3191	2012	2422	1444	1854	1360	1770	83
22. Technical and theoretical subjects	2595	3385	3250	4040	9947	9837	6857	7649	6271	6611	5053	5844	158
TOTAL	7710	11005	10121	13416	26078	28473	18967	22262	16894	19738	14544	17839	

D_{69} stands for the number of teachers who should enter the teaching profession (or stop teaching) by 1969/70. New teachers are required because of the increase in the number of pupils and in order to compensate for the loss of teachers through retirement and death.

D_{74} is analogous to D_{69} for the period 1969/70 - 1974/75

Total = D_{69} + 5x is the number of teachers who should enter the teaching profession (or stop teaching). It results from the increase in the number of pupils, compensation for the loss of teachers through retirement and death and from the substitution of untrained teachers by the trained ones.

$x = 0.084\ Ni,_{64}$ ($Ni,_{64}$ is the number of untrained teachers in 1964)

TABLE XI

Types of vocational schools	Training required for second-level			school teachers
	group of subjects: general and social education	group of subjects: natural sciences	vocational theoretical subjects	practical training
Technical and other schools for business and civil services	third-level education	third-level education	third-level education	secondary and higher education in the ratio 1 : 1
Schools for skilled workers	third-level education	third-level education	third-level and higher in the ratio 1 : 1	secondary and higher education in the ratio : 1 : 1
Secondary vocational schools for adults	third-level education	third-level education	third-level education	secondary and higher education in the ratio 1 : 1
Schools for adults skilled workers	third-level education	third-level education	third-level and higher education in the ratio 1 : 1	secondary and higher education in the ratio 1 : 1

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